Logistics Management Institute

Cost-Effective and Responsive Mail Service at the National Institutes of Health

NI401R1

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Executive Summary

The National Institutes of Health (NIH) operates a mail service for its 21,000 employees located on and nearby its campus in Bethesda, Md. That service delivers 30,000 pieces of mail a day to some 800 mail stops in 68 separate buildings. It also posts 9,000 pieces of outgoing mail daily. It utilizes 54.5 in-house full-time equivalent (FTE) employees, and because of widespread customer dissatisfaction with long delivery times, it has added another 22 temporary contract FTE employees to sort, deliver, and meter the mail. NIH wants to know the most cost-effective way to meet the mail service needs of the NIH community in terms of services provided, mix of in-house and contract operations, number of employees, degree of centralization of services, and amount of automation. Ideally, it would like to improve services and reduce the cost of the operation. We believe it can do both, with potential savings of up to $1.2 million per year.

We studied the NIH mail operation in detail and compared it to mail operations at other organizations. Based on the findings of that analysis, we drew the following conclusions:

- The recent introduction of temporary labor has successfully reduced mail delivery times.
- A totally centralized operation is more cost-efficient than a decentralized one and can provide the service customers desire.
- Extensive automation of the sorting process, using optical character recognition equipment, does not make economic sense at this time but may be appropriate later. Simple automation, geared toward making the manual sorting job more efficient, however, makes economic sense and should be pursued.
- The NIH population will generally accept the delivery of mail to centrally located sets of mailboxes (clusters) within each building if that will improve the service.
- A contract operation would be more efficient at NIH and therefore less costly but only makes sense in the short term if NIH is willing to eliminate positions by reassignment or other means.

- The Mail Services Branch has more than enough in-house staffing to provide adequate mail service to the NIH population if it uses labor resources as productively as such resources are used in other organizations we visited.

- Improvements to the mail operation should concentrate on the sorting process. Those improvements should include method changes and increased management support to employees performing that function.

We recommend that, in the short term, NIH utilize a centralized operation without extensive automation and run that operation primarily with in-house employees. We also recommend that NIH provide cluster delivery service. The current level of 54.5 in-house employees plus 3 temporary employees, not counting administrative staff, can be used to support that type of operation. The basic premise of this strategy is that the Mail Services Branch can eliminate most of the temporary labor, and maintain improved service levels, by providing cluster deliveries in place of the current labor-intensive door-to-door deliveries. Centralizing the operation will create space in the satellite buildings to accommodate cluster boxes, and that centralized operation will set the stage for productivity improvements that can be achieved later.

We recommend that, in the intermediate term, NIH stress the evolution to a more efficient operation. We believe that 36 FTE employees can operate the system effectively. That belief is based on achieving a productivity rate that is midway between current levels and those levels achieved by the most efficient organizations we found in our benchmarking study. The emphasis of this strategy should be to improve sorting productivity by providing better direction to employees and by making the sorting task easier to perform. The change to a centralized operation should improve employee direction almost immediately because of an improved layout that allows management to clearly view all ongoing activities. Sorting will be improved as the Mail Services Branch adopts a documented, organized approach to its sorting network and begins to successfully take advantage of zip+4 coding on incoming mail.

We recommend that, in the long term, NIH use a centralized operation run by contract employees providing cluster deliveries. We believe a contractor-run operation will be more efficient than a government-run one and that a contractor will require approximately 27 FTE employees to provide the specified service. We found that government organizations using centralized operations run by fully competitive contractors were generally more efficient than those staffed with in-house employees. NIH should move to the use of a contractor only when it no longer has enough in-house employees to provide the required service and it is willing to eliminate any remaining positions by reassignment or other means. We believe that a mail service contract can be managed by existing administrative support staff.

Adopting our recommended actions and strategies will result in total, quantifiable, short-term labor savings to NIH of approximately $500,000 annually, intermediate-term savings of approximately $1 million annually, and long-term savings of $1.2 million annually. In addition, the number of in-house FTE

employees will be reduced by 18.5 in the intermediate term and 54.5 in the long term. Most important, however, service will be timely and the NIH population will be likely to use the mail service rather than other, more costly forms of communication.

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CHAPTER 1

Introduction

At the National Institutes of Health (NIH) in Bethesda, Md., more than 21,000 persons perform biomedical research into the causes, prevention, and cure of diseases. Three quarters of those employees work in clinics, offices, laboratories, and other specialized facilities on a 300-acre college-like campus, and the remaining employees work in facilities located in and around the Bethesda area.[1] NIH has 49 buildings on its campus and utilizes another 19 buildings off campus. Many of those off-campus sites are located near one another and are within 3 miles of the campus. The furthest building, however, is 10 miles away.

A mail service that NIH operates sorts and delivers mail to its employees. The delivered mail includes United States Postal Service (USPS) and NIH interoffice mail. The NIH mail service is also responsible for picking up outgoing mail and applying postage to it. It delivers 30,000 pieces of mail to more than 800 mail stops, and it posts 9,000 pieces of outgoing mail daily.

Widespread customer dissatisfaction with the mail service has resulted from long delivery times and unprecedented backlogs of mail waiting to be sorted. Those backlogs occurred for a variety of reasons, including the confusion created by recently moving the main mail sorting facility from the NIH campus to an off-campus site several miles away and the large number of snow days in the Washington, D.C., area during the winter of 1994. NIH has added temporary employees in an effort to eliminate the backlog and provide more timely mail service. Most of the management staff in the mail operation feel that more permanent resources are needed to provide adequate mail service to the NIH community. The additional resources they are considering include greater use of contract labor to supplement their in-house staff, more in-house employees, and expensive capital equipment to automate the sorting process.

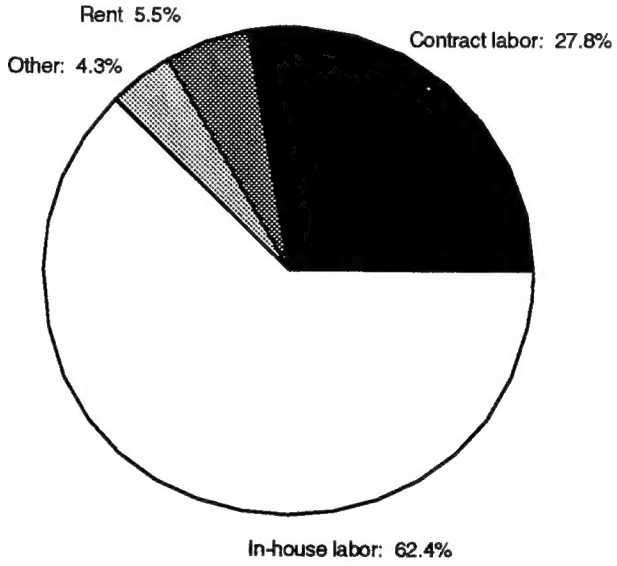
ORGANIZATION, COSTS, AND SERVICES PROVIDED

The Mail Services Branch (MSB), part of the Division of Support Services (DSS), operates NIH's mail service. DSS is part of the Office of Research Services (ORS), under the Office of the Director (OD), the administrative arm of NIH. The scientific community at NIH is divided into 25 institutes, centers, and divisions (ICDs), each of which is devoted to research in specific fields of medicine. While each ICD has its own administrative staff, many administrative functions like the mail service are provided by a central staff in the OD. The costs of such

[1] NIH also operates programs in Baltimore and Frederick, Md., and further away at locations in Montana and North Carolina. Those employees are not included in the 21,000 figure.

services are recovered in one of two ways: either through the Management Fund, which allocates them across the various ICDs, or through the Service and Supply Fund, which charges users directly for specific services provided. The MSB recovers its costs through the Management Fund.

The MSB has annual operating expenses of $2.1 million. Figure 1-1 shows how that amount is divided among in-house labor, contract labor, rent, and other expenses.[2] More than 90 percent of the budget is spent on labor and associated benefits. The processes employed are highly labor intensive and use 54.5 NIH-employed, full-time-equivalent (FTE) employees and another 22 temporary contract FTE employees. Many of those contract employees were recently added to accommodate the severe backlogs in the sorting and delivery operation that have developed over time.



Notes: Total operating costs of $2,129,901 include $1,328,405 for in-house labor, $591,360 for contract labor, $117,436 for rent, and $92,000 for other expenses. Labor costs do not include the cost of five administrative staff.

Figure 1-1.
NIH Mail Service Branch Annual Operating Costs

The MSB provides two basic services: delivery of incoming mail to NIH employees (from USPS or from other NIH employees) and pickup and subsequent posting of outgoing mail. It operates a central processing facility utilizing

[2] The labor costs do not include the cost of five administrative staff. Also, the actual operating expense figure of $2.1 million differs from the Mail Service Branch FY94 budget of $1.9 million in that it reflects annualized values of actual rental costs and actual in-house and temporary contract labor costs.

10,676 square feet in Rockville, Md. (Stonestreet facility), approximately five miles from the main campus in Bethesda. It also operates satellite mail processing and delivery operations in Buildings 1, 10, 12, 13, 30, 31, 36, and 49 on campus and in the Federal, Westwood, and Executive Plaza North buildings off campus. The employees assigned to each of those locations perform various work functions associated with sorting, transporting, delivering, and posting mail.

Management Concerns

Executive management at NIH is concerned about the effect the mail service operation may have on NIH's research programs. It has requested that this analysis address two major concerns. First, executive management needs advice on how to resolve the MSB's current problems with backlogs, processing delays, and poor reliability. Management does not know whether it has put enough resources in MSB or whether more are needed to accomplish the task at hand. Second, executive management needs supportable recommendations on how to configure the mail operation in terms of services provided, mix of in-house and contract operations, number of employees, degree of centralization of services, process changes and improvements, and amount of automation needed to sort and deliver mail as economically and flexibly as possible. In making these recommendations, we are cautioned that MSB is NIH's largest employer of handicapped persons and recommendations that adversely affect staffing will adversely affect that very special population of employees.

The overall objective of executive management is to provide more responsive, reliable mail services to NIH customers using the most cost-effective mix of contract and in-house resources.

Report Organization

The remainder of our report is presented in four chapters. Chapter 2 describes the current mail service operation in terms of workload, labor usage, processes employed, and productivity. It also contains the results of our customer survey to determine required service levels and perceptions of current service provided. Chapter 3 presents information we gathered while visiting mail service operations at other organizations and identifies specific opportunities for improvement of the NIH mail service operation based on those visits. Chapter 4 presents our analysis of the long-term strategic options available to NIH, including manual versus automated sorting and centralized versus decentralized operations. Finally, Chapter 5 presents our conclusions and recommendations. We draw specific conclusions about the NIH mail operation in the areas of centralization, automation, workload reduction, the use of contractors, staffing resources required, and productivity improvement opportunities. We recommend overall, short-, intermediate-, and long-term strategic goals for the operation and the steps the NIH Mail Services Branch needs to take to achieve

those goals. We also discuss some operational issues that MSB must address in following our recommendations.

Included in our report are three appendices. Appendix A contains a copy of the customer survey and accompanying letter sent to all of the ICDs. Appendix B contains all of the data we collected in our benchmarking analysis, and Appendix C contains a methodology for determining the operational details of the mail delivery operation and associated network.

CHAPTER 2

Current Operation at NIH

In this chapter, we address workload, labor usage, and processes currently followed at NIH. We then make some observations about work force productivity, and finally we present the results of our survey of the customers of the mail operation.

WORKLOAD

The MSB receives 30,000 pieces of mail daily for delivery to the NIH population.[1] Of that number, about 27,000 are from USPS, 2,000 are NIH interoffice mail, and less than 1,000 are internal mailings produced by the NIH Reproduction Branch, a sister operation to MSB housed in the same facility. Those 30,000 pieces are delivered to 886 mail stops in 68 buildings (49 on campus and 19 off campus) serving a population of 21,671 NIH employees. About 48 percent of the mail received by MSB for delivery is letter-sized (4-¼ in. by 9-½ in.), 36 percent is flat-sized (10 in. by 12 in.), and the remaining amount is bulk mail of various sizes.

Table 2-1 shows the distribution of the mail, mail stops, and customers by building. Ten buildings account for about 80 percent of the deliveries: Buildings 10, 12, 13, 31, 36, 37, and 49 on campus and the Executive Plaza, Westwood, and Federal buildings off campus. About three quarters (77.4 percent) of the mail is delivered to on-campus locations. The actual distribution of mail delivered to each building correlates very closely to the populations of NIH employees resident in those buildings. The distribution of mail stops also correlates closely to the distribution of mail delivered with two exceptions — the Executive Plaza and Westwood buildings appear to have more than their fair share of mail stops. The number of employees served per mail stop is significantly lower in those buildings than in the others (12.4 and 11.7 persons served per mail stop for Executive Plaza and Westwood, respectively, versus 28.5 persons served per mail stop for all other NIH buildings combined).

The MSB posts an average of 9,000 pieces of mail daily. That mail is picked up during the day by MSB employees when deliveries are made and is brought back to either a satellite or a central facility for the application of postage. Postage meters are located in Building 10, the Westwood building, and the central facility in Rockville. The mail is weighed, the correct postage is applied with

[1] An average of 30,000 pieces per day arrive for delivery six days a week (Sundays and holidays excepted). Total annual volume of mail for delivery is 9 million pieces per year.

metering equipment, and it is picked up by USPS and processed at the Suburban Maryland Processing and Distribution Center in Gaithersburg, Md.

Table 2-1
Distribution of Mail by Building

Building	Mail delivered (percentage)	Mail stops (percentage)	Persons served (percentage)
Building 10	30.3	24.8	30.1
Building 31	15.3	16.0	12.8
Executive Plaza	6.0	10.5	5.3
Building 37	5.9	3.2	4.5
Westwood	5.2	13.8	6.6
Building 49	4.3	1.4	n/a
Building 36	3.7	4.6	3.0
Federal	3.2	3.5	2.8
Building 12	3.0	3.3	2.2
Building 13	2.9	2.6	3.0
Other	20.3	16.3	29.7

Note: n/a = not available.

LABOR USAGE

Of the 76.5 FTE employees currently devoted to processing the mail, 66.5 are involved in sorting and delivering incoming mail.[2] Table 2-2 shows the breakout of assigned in-house, contract, and total FTE employees by function. The functions related to incoming mail processing are sorting at the central and satellite facilities (36 FTE employees), supervising the sorters (4 FTE employees), driving or transporting the mail to satellite buildings and other final destinations (6 FTE employees), supervising the drivers (1 FTE employee), and delivering the mail at the satellite operations (19.5 FTE employees). The remaining functions include metering or preparing mail for metering (7 FTE employees), reading misdirected mail (2.5 FTE employees), and tracking accountable mail (0.5 FTE employee). Because of the large number of FTE employees devoted to processing incoming mail, much of our analysis is focused on that part of the operation.

We also obtained data on the actual number of employees performing specific activities over a two-week period in March 1994 and found close correlation to the assigned employees. The actual number of FTE employees assigned to each function is shown in the last column of Table 2-2. During the two-week period, 68.5 FTE employees were at work. That translates to a 10.5 percent absentee rate (primarily annual and sick leave), a value well within the typical 10 to 15 percent range we commonly observe in many organizations.

[2]The 76.5 FTE employees do not include 5 administrative staff in MSB (the branch chief, deputy chief, an administrative supervisor, and 2 clerks).

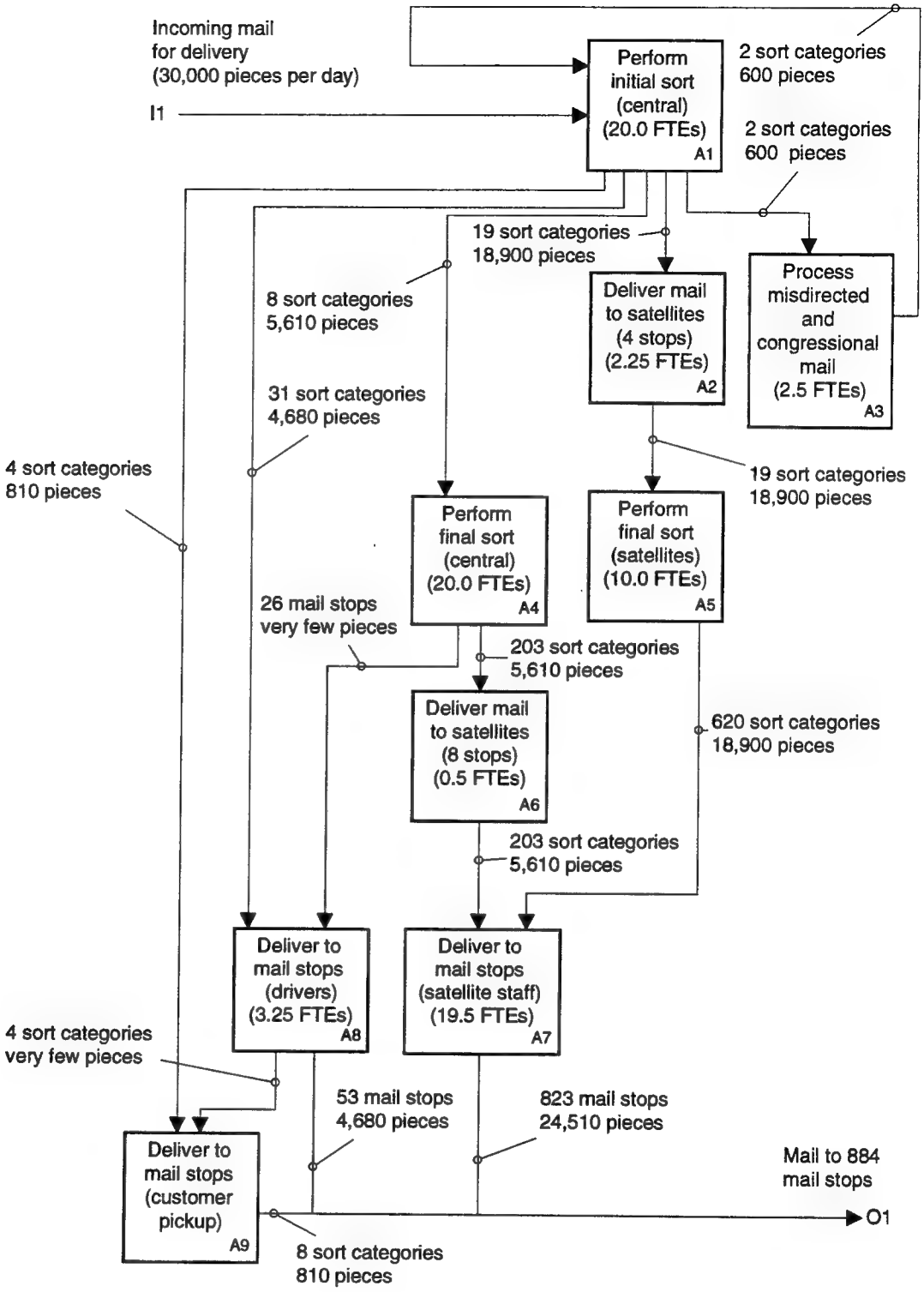
Table 2-2.
NIH Mail Service Branch FTE by Function

Function	In-house assigned	Contract assigned	Total assigned	Daily average available
Sorting and related tasks	25.0	11.0	36.0	32.5
Supervising sorters	4.0	0.0	4.0	3.6
Driving	2.0	4.0	6.0	5.8
Supervising drivers	1.0	0.0	1.0	1.0
Delivering door to door	12.5	7.0	19.5	15.5
Metering and related tasks	7.0	0.0	7.0	6.8
Reading misdirected mail	2.5	0.0	2.5	2.8
Tracking accountable mail	0.5	0.0	0.5	0.5
Total	54.5	22.0	76.5	68.5

PROCESSES EMPLOYED

The incoming mail delivery strategy is a mix of centralized and decentralized processes (see Figure 2-1). All incoming mail is delivered to the central facility by either the USPS drivers (outside mail) or by NIH drivers (interoffice mail). That mail is first sorted (presorted) in the central facility into 64 categories that generally represent buildings or floors of buildings. Once those sortings are complete, the mail is further sorted (final sorting) down to its destination mail stop within each building. Some of that final sorting is performed at the central facility, and some is performed at the satellite facilities. Mail is transported in vans on scheduled routes from the central facility either to the satellite operations or to its destination building if that building does not have a satellite staff. Employees at the satellite buildings perform the final sorting if it has not been done at the central facility and deliver the mail to the various mail stops in that building. The drivers who transport the mail deliver directly to mail stops in buildings where no satellite staff exists. Those buildings generally have one or a few mail stops. Buildings with many employees and mail stops have satellite staffs.

The satellite staff and drivers pick up outgoing mail as deliveries are made to mail stops. That mail is divided into interoffice mail and USPS mail and is brought back to the central facility for processing. The interoffice mail is placed with the incoming USPS mail and handled in exactly the same way as described above. The outgoing USPS mail is weighed, postage is applied using a meter, and the mail is picked up and subsequently processed by USPS.



Note: The labels A1 through A9, I1, and O1 are for identification purposes only.

Figure 2-1.
NIH Mail Sortation and Delivery Process

The MSB performs one other key activity that utilizes valuable labor hours — it handles misdirected mail. While that activity is technically part of the sorting operation, we have singled it out because of the time it consumes daily (about 2.5 FTE employees are devoted to that task). Mail whose presorting category cannot be identified because of an incomplete or incorrect address requires additional handling. The sorters attempt to determine the correct destination by looking up the addressee's current location in a computerized version of the NIH phone directory. If that attempt fails to reveal a current location for the addressee or if the mail shows no addressee, the sorter puts that piece of mail aside for a "reader" to process. The readers open the mail or use some other means to determine where to direct the particular piece of mail. When a correct delivery mail stop is found, the sorters or readers write the location of that stop on the envelope and return it to the sorting and delivery process for further handling. Mail whose destination cannot be determined is returned to the sender.

Work Force Productivity Observations

In this section, we examine the productivity of the MSB work force. First, we define productivity and its two components, efficiency and utilization. Next, we present our calculations of labor productivity for key functions performed by MSB employees. Finally, we present specific observations about operational conditions we believe hamper the two components of productivity and productivity in general.

Productivity, Efficiency, and Utilization

Productivity is defined here as the output produced per labor hour expended. In the context of the mail operation, it includes pieces sorted per hour, pieces metered per hour, and delivery stops per hour (by either drivers or couriers).

Efficiency is defined here as the output produced per labor hour expended when employees are actually performing the task they were assigned. For a mail sorter, for example, efficiency is defined as the pieces sorted divided by the time that individual spent doing the sorting. It does not include time spent doing anything else. Efficiency is a function of

- the method management has defined to perform the task and
- the skill level of the employee in following that method.

Utilization is defined here as the percentage of the time employees spend doing the tasks to which they were assigned. It is the amount of their time that is productive. Utilization is a function of

- the time spent on breaks or other non-job-related activities,

- the management support provided when the method fails (e.g., mail is misaddressed or equipment breaks down), and
- the amount of time for which workload is available to be processed.

Utilization is calculated as the number of hours spent doing the assigned task divided by the total number of hours worked. Note that the mathematical product of efficiency and utilization is equal to productivity.

Current Productivity Levels

We calculated current productivity levels by comparing average daily workload in four functions (sorting, metering, delivering, and transporting) to the average daily hours worked in each of those functions over a 2-week period. Table 2-3 shows the results of those calculations. The presorting and final sorting activities combined have an average productivity level of 193.2 pieces per hour; the mail is metered at a rate of 165.4 pieces per hour; the mail is delivered by couriers at the rate of about 13.3 stops per hour; and the mail is delivered to satellite buildings and mail stops by drivers at the rate of 3.0 stops per hour.

Table 2-3.
Current Productivity Level

Activity	Average daily workload	Average daily hours	Average daily productivity (per hour)
Sorting	54,570 pieces	282.4	193.2 pieces
Metering	9,000 pieces	54.4	165.4 pieces
Delivering	1,646 stops	124.0	13.3 stops
Transporting	138 stops	46.4	3.0 stops

Notes: (1) Calculations include only hours actually worked (i.e., leave time not included). (2) Sorting volume is 30,000 pieces presorted plus 24,570 pieces final-sorted. (3) Deliveries are to 823 stops twice a day. Transportation is for 69 stops twice a day. (4) Another 80.8 hours daily are consumed by supervisory (36.8), administrative (40.0), and accountable mail functions (4.0).

Factors That Hamper Efficiency, Utilization, and Productivity

We believe three key factors hamper the efficiency of the operation. First, some of the employees are handicapped and may be unable to perform the work (as it is currently defined) efficiently. NIH has chosen to "accommodate" these employees in the mail operation; however, that accommodation is based on their ability to do the job. The MSB management has indicated to us on a number of occasions that some of these individuals do not meet the minimum performance standards they need. Essentially, MSB management has said that the skill levels of some of its employees are not satisfactory. Second, although the sorting job does not require skilled labor, the job is difficult to perform because the mail stops have no numbers. All mail is addressed to buildings and room numbers

with no consistency among locations. Understanding the names of the different buildings is difficult, and mastering the sorting process requires some learning. The latter problem leads us to believe the sorting method may be inadequate. Successful use of the zip+4 coding scheme should eliminate this deficiency. Third, the current facility layout and process organization create inefficiencies because mail is handled excessively, and those deficiencies are also method-related. The mail should be handled the fewest times possible. We saw instances in which mail was handled several times at the satellite facilities. An improvement in the layout at the central facility could result in less handling and greater efficiency.

Three major conditions contribute to the low utilization of labor hours. First, a considerable amount of nonproductive time could be avoided. We witnessed employees going to the NIH campus to obtain Metro (Washington, D.C., subway) passes and make visits to the credit union. On many occasions, we saw far fewer employees at the sorting stations than were assigned there. We do not know whether the missing employees were performing job-related activities, but they were not sorting the mail. Second, the central facility layout is too spread out to adequately supervise and support employees who experience difficulty or unusual conditions in performing their daily activities. The recent layout change has helped but there is still some room for improvement. The more compact and visible the entire group of employees is to supervisors and managers, the more able those supervisors and managers are to support the employees when problems arise that hamper their utilization. Third, we saw a significant amount of time being spent locating correct delivery addresses for misdirected mail. While our labor usage numbers show 2.5 FTE employees allocated to "reading" misdirected mail, the actual amount of time spent on misdirected mail is far higher because the sorters first try to locate correct addresses before they pass the problem mail on to the readers. Some of this time can be avoided through technology improvement, process improvement, and zip+4 usage.

We believe that the fact that both workload and employee productivity are not currently measured has a serious impact on the ability of MSB management to make any productivity improvement. No standards (written or otherwise) are available for supervisors or managers to use in planning their work schedules or in monitoring individual employee performance. Without at least being able to *measure* productivity, it will be impossible to set any goals or document any improvement.

CURRENT BACKLOG

We observed the gradual depletion of a large backlog of mail waiting to be sorted during the course of our study of the NIH mail operation. At the beginning of our analysis in late January 1994, we saw mail waiting to be sorted that had arrived 10 days to 2 weeks earlier. By late March 1994, all mail waiting to be sorted had been there for 1 or 2 days at the very most. Most of the time, the backlog was virtually nonexistent.

CUSTOMER SURVEY

To assess customer perceptions and requirements of NIH mail service operations, we surveyed each of the 26 ICD mail managers.[3] The mail managers were asked to provide answers that reflect the views of the employees within their ICD as much as possible. The survey contained 12 questions addressing the following issues:

- Actual time to receive the surveys through the mail system
- Expectations regarding mail delivery times and desired service frequency
- Current level of satisfaction and reasons
- Reactions to the use of central mail clusters instead of door-to-door delivery within buildings
- Reduction of the mail volume
- Suggestions for improvement.

Appendix A presents a copy of the survey questions and a copy of the letter sent with each questionnaire to the mail managers. We also contacted the mail managers by telephone to advise them of the survey. Twenty of the 26 ICD mail managers responded to the survey. We collected the surveys in person and answered all questions about them. The ICD mail managers were extremely cooperative in providing information and seemed genuinely interested in helping MSB improve its service.

Actual Time to Receive the Surveys

The MSB took between 1 and 4 days to deliver the surveys after receiving them from USPS. The surveys were mailed over a weekend and took between 4 and 7 days to arrive in the hands of the addressees. The surveys were mailed on the evening of Friday, March 18, 1994, and arrived at the Suburban Maryland Processing and Distribution Center (USPS sorting facility) on that same evening. Of the 20 survey respondents, 18 identified the date on which they received the survey. Assuming the surveys were delivered by USPS to the MSB facility no later than the following Monday morning (March 21), 39 percent of the addressees received the surveys the following day, 11 percent received them within two days, 28 percent within three days, and 22 percent within four days. We do not know how much time, if any, elapsed between the time the surveys were delivered by MSB to the mail stops and the time they were received and opened by the individual addressees.

[3] The 26 ICDs include the 25 scientific research ICDs and the Office of the Director.

Acceptable Delivery Time Frames

Most of the respondents expect their mail to be delivered within one or two days of the time it arrives at the NIH central mail processing facility. To determine customers' expectations as to how long it should take the MSB to deliver mail upon receipt from the USPS or interoffice correspondent, we asked the mail managers what time frame they regard as acceptable for both individually addressed mail and nonindividually addressed mail. For individually addressed mail, 53 percent of the 19 respondents who answered this question indicated a 24-hour delivery time frame as being acceptable. Some 47 percent of the respondents indicated 48 hours or more. For nonindividually addressed mail, 32 percent of the respondents indicated a 24-hour time frame, 26 percent indicated 48 hours, and 42 percent indicated 72 hours or more. The detailed responses are identified in Table 2-4.

Table 2-4.
Acceptable Time Frame for Delivery

Delivery time (days)	Individually addressed	Not individually addressed
1	10	6
2	8	5
3	1	3
4	–	2
5	–	3
Total ICDs responding	19	19

Desired Mail Delivery and Pickup Frequency

The overwhelming majority of the NIH population wants its mail picked up and delivered twice a day. In the survey, we asked respondents to identify the desired number of pickups and the desired number of deliveries per day for USPS mail and for interoffice mail. More than 90 percent of the respondents indicated a preference for twice daily pickups and deliveries for both USPS mail and interoffice mail. The detailed responses are identified in Table 2-5.

Level of Satisfaction

The current level of satisfaction with the NIH mail service is low. Nineteen of 20 respondents indicated their level of satisfaction with current service provided by MSB. Of those, 37 percent indicated that they are highly dissatisfied; 45 percent, dissatisfied; and 18 percent, satisfied. No one was highly satisfied. Dissatisfied customers identified delays associated with delivery of incoming mail, including interoffice mail, and processing the outgoing mail as their

primary reason for being dissatisfied. Those delays, some respondents pointed out, are especially bothersome when time-sensitive material such as invoices, meeting notices, and patient admission information are involved. Several respondents indicated that mail service is erratic, and one respondent indicated that MSB staff members who deliver the mail to his building are "rude and unresponsive."

Table 2-5.
Frequency of Delivery and Pickup Needed

Desired daily frequency	Delivery of USPS mail	Delivery of NIH mail	Pickup of USPS mail	Pickup of NIH mail
Once	3	2	2	2
Twice	17	18	16	17
Total ICDs responding	20	20	18	19

Reaction to Central Mail Clusters

To gauge the NIH population's reaction to the use of central mail clusters instead of door-to-door delivery within each building, the survey first described generally how it would work and identified the advantage to using such a system. As the survey explained, each building would contain one or a few central clusters of mailboxes. The cluster would contain one mailbox for each of the current mail stops in the building. Twice daily, or more frequently if required, one individual from each of the current mail stop areas would pick up the mail for his or her group and drop off any outgoing mail at the central cluster area. The advantage of this approach, the survey points out, is that MSB can devote more effort to sorting the mail and delivering it to the central cluster mailbox. As a result, service to the customer should be improved. The disadvantage is that someone must pick up mail from the cluster location.

The survey then asked the respondent to indicate whether that approach would be acceptable, assuming that service continues to be at least as good as it is currently. If the respondent is opposed to this approach, the survey asked why.

The NIH population, for the most part, would accept the use of cluster deliveries if that resulted in the same or better mail service to them. Eighteen of 20 respondents indicated their reaction to the use of central mail clusters. Of those, 83 percent, or 15, of the respondents agreed to that approach. Those respondents that did not agree were concerned that cluster delivery would require additional personnel in their ICD. Those that did not indicate their reaction already use the cluster delivery approach in some form.

Reduction of Mail Volume

The survey questioned whether electronic mail is being used at NIH so that we could assess the potential for reducing interoffice mail by expanding the use of electronic mail. Of the 20 respondents, all but one currently use electronic mail.

The survey also asked respondents to provide suggestions that could result in reduction of paper sent through the mail stream. The following suggestions were submitted:

- Discard junk mail.
- Use electronic mail and faxes more frequently.
- Send announcements through electronic mail to mail stop coordinators for central posting.

Suggestions for Improvement

The final question of the survey asked respondents to provide suggestions for improving the mail service. The following suggestions were provided:

- Contact mailing companies to update mailing lists.
- Return misaddressed junk mail to the sender.
- Update NIH mailing lists. Mailing lists currently contain duplicate names and names of people who have left NIH or should not be on a particular mailing list.
- Provide administrative officers with the capability to update mailing lists, correct addresses, and generally maintain mailing lists in an on-line mode.
- Provide NIH coordinated courier service and provide more special messenger services off campus.
- Provide consistent service and adhere to a regular schedule.

CHAPTER 3

Benchmarking Analysis

Benchmarking is the continuous process of comparing the performance or practices of an organization against the best practices of other organizations. The organizations with the best practices are referred to in benchmarking terminology as best-in-class or world-class organizations. The purpose of benchmarking is to identify opportunities for improving an organization's product, services, work processes, operations, or functions. It is not intended as a means for one organization to copy or imitate the performances or practices of another organization that is more successful; rather, its intent is to identify another organization's best practices and strive to implement those practices that are most applicable.

As part of this study, we performed a modified version of a functional benchmarking analysis of mail service operations involving ten different organizations throughout the Washington, D.C., metropolitan area. Instead of a continuous process of comparison, we compared mail service operations of NIH and the other organizations at a single point in time. Because we limited our comparison to organizations in the local area, we may have excluded some highly efficient organizations. However, the large number of participants in our analysis enabled us to find some organizations with better practices than NIH. In this report, we refer to those organizations as "best in class."

We selected organizations that we believed were similar to NIH in terms of the environment in which they operate, the amount of mail they process, and the number of mail stops and customers they support. We selected organizations that use contractors to provide their mail service as well as those that perform those services with in-house employees. We focused primarily on sorting and delivering USPS and interoffice mail although we did collect some information on the metering of outgoing USPS mail. This chapter reflects the data that we compiled on each organization that participated in the benchmarking analysis and some general findings on the practices of the best-in-class organizations in sorting and delivering incoming mail.

PARTICIPATING ORGANIZATIONS

We initially telephoned managers in the organizations we identified as potential benchmarking candidates. We then sent letters to those who indicated interest in participating. The letter explained our effort, identified the data that we hoped to collect, and promised that we would provide a compilation of the results (maintaining confidentiality of the information, of course) as an incentive for them to assist us. Ten organizations, including 3 universities, 6 government

agencies, and 1 military base, participated (see Table 3-1). Of those 10 organizations, 4 use contractor-provided labor in their mail service operations and 6 use in-house employees. Those organizations using contractors said they did so because of lower labor costs or improved service. At each organization, we visited the mail service facility, obtained the desired data, and observed the actual operation.

Table 3-1.
Organizations Participating in Benchmarking Analysis

Agency for International Development
Andrews Air Force Base
Environmental Protection Agency
George Mason University
Georgetown University
National Security Agency
National Aeronautics and Space Administration
Office of Thrift Supervision
United States Department of Agriculture
University of Maryland

Table 3-2 reflects characteristic information about each of the participating organizations. To maintain confidentiality of the information provided by the benchmark organizations, we have identified each organization by an alphabetic letter. The first row of the table indicates whether the participating organization is a university, government agency, or military base. The next two rows of the table identify the average annual number in thousands of pieces of incoming USPS and interoffice mail and outgoing mail metered by the central mail service facility, excluding bulk mail distributions and classified mail.

The next three rows identify the number of mail stops, buildings, and customers supported by the central mail service. For universities, the number of mail stops includes only the department mail, not mail addressed to students residing in dormitories. The number of customers at universities includes faculty, staff, and resident students.

The next row in Table 3-2 identifies the total number of FTE employees in each organization's mail service branch or its equivalent. The last row identifies the average annual cost, including salary and benefits, of direct and supervisory employees in each organization.

Table 3-2.
Characteristics of Benchmark Organizations

Organization	Characteristic							
	Type of organization[a]	Incoming pieces per year (000s)	Outgoing pieces per year (000s)	Mail stops	Buildings	Customers	FTE employees	Average cost per employee[b] ($)
A	U	8,000	468	165	12	11,100	13.5	24,560
B	U	6,911	3,474	196	86	16,500	18.0	22,941
C	G	4,212	360	300	34	9,000	11.0	45,000
D	G	5,529	363	320	8	6,500	19.0	32,529
E	U	2,250	2,390	250	75	5,500	9.0	26,667
F	G	8,020	360	700	17	20,000	24.0	43,000
G	G	598	254	50	1	1,700	6.0	25,000
H	M	550	720	101	99	10,263	10.0	25,111
I	G	6,500	—	558	18	14,000	66.0	20,508
J	G	4,345	1,598	320	9	9,429	58.0	22,161
NIH	G	9,000	2,250	886	68	21,671	81.5	25,098

[a] U = university; G = government agency; M = military base.

[b] Average cost per employee includes supervisory staff and benefits, but does not include management staff.

STRATEGIES EMPLOYED BY PARTICIPATING ORGANIZATIONS

With one exception, the organizations participating in the benchmarking analysis receive mail at a central facility, sort it there, and then distribute it to multiple buildings.[1] Some of those organizations perform the entire sorting function at the central facility, while others presort it at the central facility and perform a final sorting at satellite mail centers.

With regard to the sorting process, 80 percent of the benchmarking participants use a code such as a mail stop, zip code, or office symbol rather than a building name and room number to sort incoming mail. None of the organizations use automated equipment to perform the sorting process. They universally felt the use of automated sorting equipment was too costly.

Most organizations deliver mail once or twice a day. Six of the 10 organizations use a central cluster of mailboxes instead of delivering mail to individual mail stops throughout each building. For those organizations that deliver all incoming mail to individual mail stops, 25 to 56 percent of employee labor hours are spent on that function, while those organizations that deliver their incoming

[1] One participating organization's mail operation services a single building.

mail to a combination of cluster mailboxes and individual mail stops use 8 to 25 percent of their employee labor hours for that purpose.

All 10 organizations have established goals of delivering mail in 24 hours or less upon receipt at the central facility. Some of the organizations have established goals of delivering mail within 4 hours and make as many as six deliveries per day. Most organizations were able to meet their goals consistently. Typically, each organization has a higher volume of mail to process on Mondays and Tuesdays and is not always able to sort and deliver all of the bulk mail within the 24-hour time period. While those organizations have enough personnel to process the average daily volume of mail, more mail has to be processed on Mondays because it is either not processed or not processed at the same rate over the weekend. Instead of hiring temporary personnel for Mondays, the organizations place priority on delivering first-class mail. As a result, some bulk mail received on Monday may not be delivered until Tuesday, and some bulk mail delivered on Tuesday may not be delivered until Wednesday. By Wednesday, both first class and bulk mail is delivered within 24 hours.

Generally, we noticed that employees at the participating benchmark organizations are cross-trained to the degree that each employee is capable of performing both the sorting and the delivery functions. During a typical day, most employees spend time, as required, performing both functions.

Comparative Analysis

Figure 3-1 illustrates NIH and each participating organization's cost per piece to sort and deliver incoming USPS and interoffice mail to its addressees. The cost includes only the direct labor cost of employees involved in the actual sorting process and includes research of improperly addressed mail. It does not include supervisory or management costs. As the figure shows, the cost varies greatly from a low of 3.2 cents to a high of 20.6 cents per piece. Relative to the participating benchmark organizations, NIH's cost to sort and deliver incoming mail is 2 to 15 percent lower than 3 of the 10 benchmark organizations, but 27 to 459 percent higher than the remaining 7 organizations.

The primary factor that contributes to NIH's higher per piece cost to process incoming mail is the relatively lower productivity of its sorting process. Eight of the 10 benchmark organizations have more efficient sorting capability than NIH. Six of those 8 organizations sort, on average, over 3,000 pieces of mail per employee per day (including only employees involved in sorting and researching mail), and the organization with the most productive sorting process sorts an average of 9,000 pieces of mail per employee per day. In comparison, NIH sorts an average of 935 pieces of mail per employee per day. All of the organizations with the more productive sorting processes use sorting designators such as mail codes instead of building names and room numbers to sort mail more quickly.

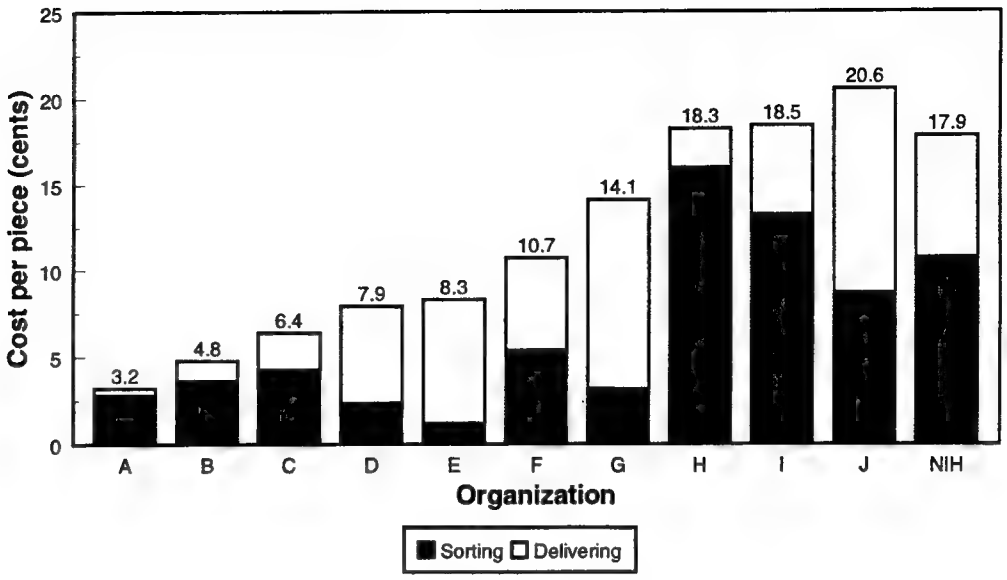


Figure 3-1.
Incoming Mail Direct Labor Cost per Piece

Another factor that contributes to NIH's higher per piece cost to process incoming mail is the number of personnel (19.5 FTE employees) it devotes delivering mail to each individual mail stop. The organizations with the lowest per piece cost to process incoming mail provide either little "door-to-door" delivery service or none at all. Instead, those organizations have established a central cluster of mailboxes in each building. Each cluster contains one mailbox for each mail stop in the building. An individual from each of the mail stop areas picks up the mail for a group and drops off any outgoing mail at the cluster. Mail couriers for those organizations spend minimal time delivering mail since all the boxes are in a central location rather than spread throughout the building at a series of mail stops.

Four of the 10 benchmark organizations contract out their mail service operations. Of those 4, 3 award contracts on a fully competitive basis, while one awards its contract as a Javits-Wagner-O'Day Act set aside.[2] Of the 3 organizations that award fully competitive contracts, two run a centralized mail service operation that supports several buildings throughout the Washington D.C., metropolitan area while the third provides decentralized mail service for a single building. Although contract labor rates are generally higher than in-house labor rates – we observed considerable variation – organizations with centralized mail service operations run by fully competitive contract companies are relatively cost-effective, ranking third and fourth (organizations C and D in Figure 3-1) of all the participating organizations in terms of the direct labor cost per piece of incoming mail.

[2] The Javits-Wagner-O'Day Act, as amended in 1971, directs Federal agencies to purchase products from workshops staffed by the blind and severely handicapped.

DISTINGUISHING FEATURES OF THE BEST ORGANIZATIONS

As a result of our benchmark analysis, we have found organizations that are more efficient in terms of either the direct labor cost per piece processed or the ratio of employees to the amount of mail processed. Those organizations that compare most favorably in our analysis deserve further scrutiny to determine what makes them more efficient and implement those practices where possible. Accordingly, we have more closely scrutinized the organizations ranked first through third in Figure 3-1 and observe the following features that distinguish them from NIH and the other organizations:

- They operate an almost totally centralized operation; that is, they generally do not use satellite centers for final sorting or additional processing of incoming mail, and all the employees work for the central mail service operation. The only exceptions to total centralization are the universities that use students at the dormitories for final sorting and for placing mail in the students' mailboxes. Department mail, however, is totally centralized.

- They use zip+4 codes or a mail code as the primary sorting designator. Use of a code instead of a building and room number appears to make sorting easier and thus more efficient. The organization that we ranked first has recently implemented use of the zip+4 code and acknowledged that while the students use it routinely, the faculty and staff are a bit more reluctant to use it.

- Relative to other organizations, they expend few labor hours actually delivering mail because they make some or all of their mail stop deliveries to central clusters of mailboxes rather than to individual departments located throughout buildings.

- They have a higher number of customers per mail stop at 45, 41, and 30 for the first, second, and third ranked organizations compared to 24 at NIH. For the universities, the customers in this calculation include only the faculty and staff, and the mail stops include only the departments.

- They do not use automated sorting equipment, but they do employ a layout that logically and efficiently accommodates the work flow, minimizes the distance that mail must be moved, provides sufficient mail staging space, and facilitates adequate management and supervision.

- They monitor workload and performance data and use those data to manage the operation better.

- They minimize the amount of unproductive time spent researching improperly addressed mail by ensuring the accuracy of their locator system and employing techniques such as alerting recipients of improperly addressed mail to notify correspondents of their correct address.

In summary, our benchmarking analysis yielded some practices that result in much more efficient processing of mail. Some or all of those practices could be beneficially applied at NIH to improve its mail operation.

CHAPTER 4

Analysis of Alternative Business Strategies

In this chapter, we focus on automation of the sorting process and centralization of the operation. In the case of automation, we present some financial analysis of a highly automated approach to mail sorting using optical character recognition (OCR) technology and a semiautomated approach to mail sorting using a specialized mail sorting conveyor. In the case of centralization, we evaluate four possible approaches to organizing the mail operation at NIH that range from performing all services at one facility (total centralization) to performing all services at various satellite facilities both on and off the campus.

AUTOMATION

Two alternatives are available to NIH to automate the processing of mail. The first is to use OCR equipment (produced by Tritek, Bell and Howell, and others) capable of reading addresses and zip codes and sorting the mail on the basis of that identification. Such equipment can recognize most type fonts but cannot handle handwritten mail. It is capable of reading addresses on both letter and flat-size envelopes but has some limitations on thickness. It is also capable of spraying mail bar codes on outgoing mail. This type of technology will cost NIH approximately $859,000 and requires maintenance costing about $60,000 per year.

The second alternative is to use a mail sorting conveyor. Essentially, this type of technology does not directly automate the sorting process but makes the job easier to do manually. The person sorting the mail is given a much smaller "sorting face," or set of slots, into which to place the sorted mail than with the current sorting racks. Once a piece of mail is placed in a particular slot, it is carried away by the sorting conveyor to an accumulation box some distance away from the sorting area. Because the sorting face is much smaller, the sorter does not have to move as much and, consequently, can sort faster. Also, because the conveyor moves the sorted mail away from the sorting area, the mail can be accumulated in larger containers and can be taken away from the accumulation area without interfering with the sorting process. Thus, this alternative offers higher sorting productivity and more efficient material handling. The technology to implement it will cost NIH $115,000 and will only require a nominal amount of maintenance each year.

We measured the financial attractiveness of each possible alternative under three different sorting productivity scenarios: with current NIH productivity

levels of slightly less than 250 pieces an hour, with productivity of 500 pieces an hour, and with productivity of 750 pieces an hour. We observed the latter productivity level in organizations with the most efficient operations in our benchmarking analysis. We assumed these levels were achieved before installation of the newer technology and that those same levels were used for mail not sorted by the newer technology (handwritten mail in the case of the OCR technology and final sortings in the case of the mail sorting conveyor). Table 4-1 shows the results of those measurements.

Table 4-1.
Financial Analysis of OCR Technology and Mail Sorting Conveyor

	Case 1: Low productivity	Case 2: Medium productivity	Case 3: High productivity
OCR Technology			
Initial cost of investment	$859,500	$859,500	$859,500
Annual savings	$402,816	$183,446	$110,323
Net present value ($)	$1,074,972	$98,378	– $227,154
Discounted rate of return	39.5%	7.6%	– 4.8%
Discounted payback years	1.8	3.7	5.9
Net FTE employees saved	15.0	6.0	3.0
Mail Sorting Conveyor			
Initial cost of investment	$115,000	$115,000	$115,000
Annual savings	$243,744	$85,310	$36,562
Net present value ($)	$970,105	$264,787	$47,766
Discounted rate of return	211.2%	68.8%	17.7%
Discounted payback years	0.5	1.3	3.0
Net FTE employees saved	10.0	3.5	1.5

Notes: (1) Calculations for both technologies use labor cost of $24,374 per FTE per year, planning horizon of 5 years, and interest rate of 4 percent. (2) Calculations for OCR technology use reject rate of 50 percent for incoming mail, residual value for equipment of $171,800 after 5 years, annual maintenance costs of $60,000, 3 machine operators, and annual postage savings of $97,200. (3) Calculations for both technologies assume manual sort productivities of 250 pieces per hour for Case 1, 500 pieces per hour for Case 2, and 750 pieces per hour for Case 3. They also use 7 productive hours per day and a 15 percent absenteeism rate. (4) Calculations for the sorting using the sort conveyor technology use productivities of 500, 750, and 1000 pieces per hour cases 1, 2, and 3 respectively.

We found that OCR technology becomes less appropriate as manual sorting productivity is improved. With current productivity levels (Case 1), the use of OCR technology saves a net 15 FTE employees, the discounted payback period is 1.8 years, the discounted rate of return is 39.5 percent, and the net present value

over a 5-year period is $1,074,972.[1] We believe these numbers to be attractive financially.[2] However, under Case 2 (some manual productivity improvement), the number of FTE employees saved drops to 6, the discounted payback period to 3.7 years, the discounted rate of return to 7.6 percent, and the net present value to $98,378. Given the risk associated with any automation, we do not consider these figures financially attractive. Under Case 3 conditions, the use of OCR technology saves a net of 3 employees, the discounted payback period is 5.9 years, the discounted rate of return is less than zero, and the net present value is less than zero. Our calculations assume a 50 percent rejection rate (a significant amount of mail must be sorted manually because it cannot be read by the OCR technology) and a residual value of the equipment after 5 years to be 20 percent of the original cost.

The financial attractiveness of the OCR technology is heavily dependent on the postage savings that can be obtained for outgoing mail. Outgoing mail that is sorted has zip+4 coding and bar coding, or can be batched into more than 50 pieces per three-digit zip code or more than 10 pieces per five-digit zip code qualifies for postage discounts. Our calculations estimate those savings to be $97,200 (2,160,000 pieces annually at 4.5 cents each). Those savings could be larger or smaller depending on mail processed by both the MSB and the Reproduction Branch. We were not able to substantiate larger savings on the basis of current data obtained.

We found that mail sorting conveyor technology was appropriate regardless of manual productivity levels. Under current productivity levels (Case 1), the mail sorting conveyor saves a net 10 FTE employees, the discounted payback period is 0.5 year, the discounted rate of return is 211.2 percent, and the net present value is $970,105. With some manual productivity improvement (Case 2), use of the mail sorting conveyor saves a net of 3.5 FTE employees, the discounted payback period is 1.3 years, the discounted rate of return is 68.8 percent, and the net present value is $264,787. With high manual productivity levels (Case 3), the net FTE employees saved is 1.5, the discounted payback period is 3 years, the discounted rate of return 17.7 percent, and the net present value $47,766. We consider all of these numbers to be financially attractive as long as the employee reduction opportunities are pursued.

CENTRALIZATION

Our analysis of centralization explores the relative cost advantages of four business strategies that define where the NIH mail should be processed. At one end of the spectrum, NIH could adopt a totally centralized approach in which all mail processing activity takes place in one central facility. At the other end of the spectrum, NIH could adopt a strategy with several satellite operations

[1] Calculations of the net present value and discounted rate of return use a 5-year horizon. The net present value calculation uses a short-term interest rate of 4.0 percent.

[2] For comparison purposes, we consider an automation investment attractive if labor savings are positive, the discounted payback period is less than 3 years, the discounted rate of return higher than 20 percent, and the net present value greater than zero.

performing the same functions.[3] Finally, in the middle of those extremes, NIH could choose to adopt some mix of the centralized and satellite approaches by performing some functions at a central facility and other functions at the satellite facilities. In this analysis, we are primarily concerned with activities related to incoming mail (to be delivered) since the bulk of the MSB manpower is used in that area. Each strategy in our analysis is defined by the locations at which presorting and final sorting of on-campus mail and off-campus mail take place.[4]

Table 4-2 defines each of the four alternatives. Alternative 1 is a completely centralized strategy. All sorting is done at a central facility, presumably at the current facility. That mail is sorted down to the mail stop level and delivered directly to mail stops from the central facility. In Alternative 2, a central facility accommodates presorting and final sorting of on-campus mail while all off-campus mail is presorted by USPS and then final sorting is performed at off-campus satellite facilities. In Alternative 3, all presorting functions for both on- and off-campus mail are performed at a central facility, and all final sorting functions are performed at satellite facilities. Finally, in Alternative 4, USPS presorts mail to the satellite building level and then final sorting is done at several satellite locations.

Table 4-2.
Centralization Analysis Alternatives

	Alternative 1: Central	Alternative 2: Mixed A	Alternative 3: Mixed B	Alternative 4: Satellite
Presort of On-campus Mail				
Performed by USPS				X
Use central facility	X	X	X	
Final Sort of On-campus Mail				
Use central facility	X	X		
Use satellite facilities			X	X
Presort of Off-campus Mail				
Performed by USPS		X	X	X
Use central facility	X			
Final Sort of Off-campus Mail				
Use central facility	X			
Use satellite facilities		X	X	X

[3] The satellite facilities would most likely be sited at some or all of the following locations: Buildings 10, 12, 13, 31, 36, 37, and 49 on campus and the Executive Plaza, Westwood, and Federal buildings off campus. About 80 percent of the mail is directed to those 10 buildings.

[4] Because of the large number of mail stops (886), we believe it necessary to continue using a two-level sort scheme (presorting and final sorting).

We found Alternative 4 (the satellite alternative) to be the most cost-effective; however, that alternative may not be feasible. NIH has been unable to get USPS to sort down to the building level and, unfortunately, USPS did not co-operate with our efforts to question them about this. In our benchmarking analysis, we found no evidence that USPS was doing such sorting for other organizations. This alternative is cost-effective because it eliminates the presorting. If this alternative were feasible, it could save as much as 20 FTE under current productivity levels and 5 FTE if productivity were to improve to the level of the most efficient organizations (best in class) we found in the benchmarking analysis.

The three remaining alternatives produce similar levels of cost-effectiveness under identical productivity assumptions although they require tradeoffs between workload reduction and supervisory requirements. We know that if the mail is properly addressed, USPS will deliver it to off-campus buildings. The savings to NIH in doing so is that off-campus mail no longer needs presorting, a savings of 5.1 FTE employees under current productivity levels and 1.7 FTE employees under the best-in-class productivity levels. The price that must be paid for satellite operations, however, whether they are on campus or off campus is increased supervision. At least 5 supervisors are needed with satellite operations and only 1 or 2 are needed without.

We do not believe that NIH can achieve the same productivity levels in satellite operations that it can achieve with a central operation. Because the work force is spread out with satellite operations, workers are less flexible and cannot be moved where they are most needed. That problem is especially apparent with many small satellite operations. In addition, separate, distinct units of employees handling the same mail can adversely affect communication and create greater opportunities for inefficiencies. These problems are apparent in the current operation in that some simple sorting changes at the central facility could reduce the amount of sorting workload at the Westwood satellite facility. Finally, we believe that a centralized operation would allow management staff to provide greater direction to the work force because management can focus on one operation instead of several.

CHAPTER 5

Conclusions and Recommendations

In this chapter, we first present eight conclusions reached as a result of our analysis. We then recommend short-term, intermediate-term, and long-term strategic goals, and we suggest specific actions MSB must take to meet those goals. Finally, we discuss operational issues MSB must address in following those actions.

CONCLUSIONS

The recent introduction of temporary labor has successfully reduced mail delivery times. We observed 10 days of incoming mail backlog at the start of this study in late January 1994. By late March 1994, we observed that those large backlogs had disappeared completely. The results of our survey conducted at that time indicate that the mail operation is, in fact, processing and delivering mail in 1 to 4 days. However, that survey shows that throughout NIH the perception that service is poor is widespread.

A totally centralized operation will be more cost-efficient than a decentralized one. While we did not find large differences between the cost-effectiveness of mixed operations and the totally centralized one for given productivity levels, we do believe it is more likely that substantial productivity improvement can be realized if all employees and processes are housed in one area. In addition, the most efficient organizations we visited in our benchmarking analysis were centralized ones.

Extensive automation of the sorting process, using OCR technology, does not make economic sense at this time but may be appropriate later. For incoming mail, the manual sorting productivity can be improved substantially. Such improvement would lessen the impact of extensive automation. The value of extensive automation may be in postage savings for outgoing mail, but those savings, to date, are questionable and hard to define. We believe NIH needs to frequently reevaluate the use of extensive automation when it is better able to identify true mail savings, when the price of that automation declines, when the technology improves, and when the relationship with USPS changes over time.[1]

The use of simple automation (the mail sorting conveyor) is cost-justifiable as long as NIH is willing to eliminate the FTE employees that it will save. Simple automation will save 10 FTE employees under current productivity levels, 3 FTE employees

[1] USPS has the automated technology in place at its sorting centers to sort mail down to a nine-digit zip code (to correspond to the NIH mail stop number). A closer relationship with USPS could conceivably eliminate or reduce the need to sort mail at NIH.

with improved productivity levels, and 1.5 FTE employees with best-in-class productivity levels. NIH currently uses 22 temporary employees in its mail operation. Even if it pursues cluster deliveries and eliminates the 19.5 FTE employees associated with delivering the mail to each mail stop, the 1.5 FTE employees needed to justify this investment can still be eliminated from the temporary labor pool.

The NIH population will generally accept the delivery of mail to centrally located sets of mailboxes (clusters) within each building if that will result in improved service. Most ICDs we surveyed would accept cluster deliveries. The ones that are not in favor of the idea believe they would need additional FTE employees to pick up the mail from their cluster area. We do not believe this to be the case since many employees frequently travel to central parts of the building for other services such as restroom visits, coffee, lunch, etc. Mail pickup for those individuals should not be a time-consuming activity. Given the opportunity, however, it becomes a time-consuming activity for someone whose primary job function is to deliver mail. Many organizations we visited in our benchmarking study were providing cluster deliveries successfully. The impact of moving toward a cluster delivery system is significant since NIH currently devotes 19.5 FTE employees to the courier delivery function. If done properly, the cluster areas can serve as small, unstaffed post offices (satellites) with well-defined interoffice, USPS, courier, and other mail slots in addition to the mailboxes for building tenants. These cluster areas, if serviced in a timely way, could actually provide a higher degree of visibility and service to the NIH community with far less labor than is used today. They need not be costly to construct – a simple set of "pigeon hole" mail slots will work – and they need not utilize much space.

A contract operation would be more cost-efficient at NIH and, therefore, less costly, but it only makes sense if NIH does not currently have enough resources or if it is willing to eliminate positions. Although contract labor may be more expensive, it is usually better managed and, consequently, more cost-efficient. If the MSB writes a contract statement of work, the mail operation will become better organized regardless of whether a contract is actually issued. Although it is possible to hire temporary labor as needed, the full benefits of contracting are achieved when the entire operation is run by a contractor. Contracting the entire operation, however, will reduce the need for a significant number of positions that currently exist.

The NIH mail operation has more than enough in-house resources to provide adequate mail service to the NIH community. The use of cluster deliveries could free up a substantial number of employees and virtually offset the need for temporary labor that is currently used to keep up with demand. We found many other organizations that provide similar service with far fewer employees. We believe that, currently, resources are not used as productively as they could be.

To use its labor resources more productively, MSB should concentrate improvement efforts on the incoming mail sorting process. A substantial number of employees (38.5) are directly associated with the sorting function. Mail sorting would be easier to do if

- mail codes or zip+4 designators were used and
- the facility layout were redesigned to minimize product handling.

The employees sorting the mail would spend more time sorting if

- they were located in one central facility with a compact but open layout (management can provide better direction to the work force in such a setting) and
- the employee locator system were kept up to date by administrative officers with on-line access to it.

To ensure improvement, productivity must be measured and employees must be evaluated against established standards.

RECOMMENDED STRATEGY

Our recommendations are divided into three parts covering short-term, intermediate-term, and long-term strategies. ***In the short term, we recommend that NIH utilize a centralized operation, without extensive automation, and run that operation primarily with in-house employees. We also recommend that NIH provide cluster delivery service.*** The current level of 54.5 in-house employees plus 3 temporary employees, not counting administrative staff, can be used to support this type of operation. The basic aim of this strategy is for the MSB to eliminate the use of temporary labor by providing cluster deliveries in place of the current labor intensive door-to-door deliveries. By centralizing the operation, space becomes available in the satellite buildings to accommodate cluster boxes, and that centralized operation sets the stage for productivity improvements that can be achieved later. We anticipate that our short-term strategy can be achieved over a six-month time frame.

In the intermediate term, we recommend that NIH stress the evolution to a more efficient operation. We believe that 36 FTE employees are needed in the intermediate term. That number is based on the ability to achieve a productivity rate that is midway between current levels and those levels achieved by the best-in-class organizations we found in our benchmarking study. The emphasis of this strategy should be to improve sorting productivity by providing better employee direction and by making the sorting task easier to perform. The centralized operation will almost immediately result in improved employee direction. The resulting improved layout will allow management to clearly view all activities within the operation. The ease with which sorting can be done will be improved as MSB adopts a documented, organized approach to its sorting network,

including the successful use of zip+4 coding on incoming mail. This process will take some time before all mailers can be advised of the new addressing scheme and begin using it. Strict enforcement of "return-to-sender" rules may be necessary to ensure its success. The time to achieve this strategy is a function of the rate at which NIH can decrease its existing staffing after making its productivity improvements. We estimate that NIH will require a minimum of 1 to 2 years to achieve the productivity improvements needed to reduce staffing.

In the long term, we recommend that NIH use contract employees to run a centralized operation providing cluster deliveries. We believe a contractor-run operation will be more efficient than a government-run one and that a contractor will require approximately 27 FTE employees to provide the required service. The move to the use of a contractor needs to be done only when NIH no longer has enough in-house employees to truly provide the required service and it is willing to eliminate any remaining positions by reassignment or other means.

RECOMMENDED ACTIONS

In order to adopt our proposed strategy, we recommend the Director, Division of Support Services, pursue the following actions in the order shown:

- *Action 1:* Continue with the following initiatives:
  - The purchase of the mail sorting conveyor to assist in the manual sorting activity.
  - Widespread use of zip+4 coding for all incoming mail and the pursuit of a corresponding public relations campaign to ensure the program's success. The zip+4 coding scheme must be planned carefully to facilitate the ease of primary and secondary sorting operations. (See recommended Action 4.)
- *Action 2:* Delay the following initiatives:
  - The purchase of OCR sorting equipment. This equipment may be purchased at a later time if proper justification can be shown on the basis of postage savings for outgoing mail.
  - Contracting mail service functions. Additional resources are not needed at this time.
- *Action 3:* Set up cluster boxes immediately in buildings that have enough space to do so. The space requirements need not be large ones; all that is needed is a small area in a corner in which to place a series of mailboxes.
- *Action 4:* Design and document a new sorting and delivery network that
  - optimizes the number of mail stops,

- balances mail stop deliveries across routes, and
- defines explicitly a primary and secondary sorting scheme that is aligned with zip+4 assignments.

We provide guidelines for MSB to design the sorting and delivery network in Appendix C.

- *Action 5:* Communicate the new delivery network to the NIH population and adhere to it. Document specific guidelines with respect to use of clusters and number of employees served per mail stop.
- *Action 6:* Design and document a new layout that supports one centralized operation in a compact, open area. That new layout should minimize handling of mail pieces,
  - allow all employees to be seen and supported by on-duty supervision and
  - utilize the mail sortation conveyor for either the primary sorting or the secondary sort with the heaviest mail volume.

  We provide a suggested layout and guidelines for MSB to follow in defining a new layout in Appendix C.
- *Action 7:* Implement the new network and central facility layout. Move all satellite staff to the central facility.
- *Action 8:* Set up remaining cluster box areas in the space vacated by satellite operations.
- *Action 9:* Eliminate 19 of the 22 temporary employees. (The use of the clusters should free up 19.5 FTE employees.)
- *Action 10:* In the new central facility, take the following actions:
  - Measure and publicize system performance to MSB employees and ICD mail representatives on a monthly basis. Gather performance data by mailing reply cards to ICD representatives or others.
  - Measure workload and labor hours by employee and function on a daily basis.
  - Develop a simple set of standards for workload planning and employee evaluation.
  - Monitor employee performance and act accordingly. Reward the high performers, and coach, discipline, or terminate the low performers.

- Realign and relabel sorting stations as the zip+4 assignments develop and change over time.

- *Action 11:* Take the following actions with other organizations (within and outside of NIH):

  - Continue training and documentation of correct addressing by NIH employees.

  - Update NIH mailing lists.

  - Update outside mailers mailing lists for NIH addresses.

  - Provide on-line access and updating of the employee locator system (telephone directory) by ICD administrative personnel.

  - Sort the mail by building or mail stop at USPS facilities.

  - Deliver mail to clusters by USPS carriers.

- *Action 12:* Eliminate remaining temporary employees as productivity improvements are realized and decrease staff further through attrition.

- *Action 13:* Add contract labor only when the number of in-house employees falls below a level at which desired service cannot be provided. We estimate this to be approximately 36 FTE employees.

- *Action 14:* Reexamine the viability of using OCR automation technology economically. If mail volumes increase, equipment costs decrease, or machine readability improves, OCR technology may prove cost-effective. It may also prove cost-effective if NIH can combine its outgoing mail with other Department of Health and Human Services or Public Health Service organizations to obtain postage savings.

Actions 1 through 9 apply to the short-term strategy, Actions 10 through 12 to the intermediate-term strategy, and Actions 13 and 14 to the long-term strategy. Table 5-1 shows our estimated FTE employee requirements for each of the three strategies compared with today's manpower allocation. The FTE requirements are 76.5, 57.5, 36.0, and 27.0 for the current, short-term, intermediate-term, and long-term strategies, respectively. By following our recommendation, NIH can save $500,000 in the short term, $1 million in the intermediate term, and $1.2 million in the long term each year on the labor costs associated with distributing the mail.[2] More importantly, our action plan will result in timely delivery and pickup of mail as well as less-frequent use of more costly forms of communication such as special deliveries by the NIH scientific community.

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[2]Labor savings calculations assume the FTE levels shown in Table 5-1 and fully burdened annual labor costs of $24,374 per FTE employee for in-house labor, and $26,880 per FTE employee for contract labor.

Table 5-1.
Current versus Recommended FTE Employees

Function	Current	Short-term strategy	Intermediate-term strategy	Long-term strategy
Sorting and related tasks	36.0	36.5	18.0	12.0
Supervising sorters	4.0	4.0	2.0	2.0
Driving	6.0	6 .0	6.0	6.0
Supervising drivers	1.0	1.0	1.0	0
Delivering door to door	19.5	0	0	0
Metering and related tasks	7.0	7.0	6.0	5.0
Reading misdirected mail	2.5	2.5	2.5	1.5
Tracking accountable mail	0.5	0.5	0.5	0.5
Total FTE employees	76.5	57.5	36.0	27.0
Number of contract FTE employees	22.0	3.0	0	27.0
Number of in-house FTE employees	54.5	54.5	36.0	0

Operational Considerations

A number of special issues must be addressed for future mail operations: the use of handicapped employees, the handling of conduct and performance problems, the scheduling of workload and planning for demand surges, and the risk involved in contracting.

Handicapped Employees

The NIH mail operation uses some handicapped employees. NIH's official policy is to "accommodate" the handicapped. Accommodation means that NIH tries to find positions where the handicapped are capable of doing the work. Some handicapped employees have been placed in MSB, and with the adoption of our recommendations, they should be able to perform most of the functions there. Obviously, this needs to be reviewed on a case-by-case basis. Those that cannot perform the functions should not be employed in MSB. The MSB management is responsible for determining the ability of the handicapped individuals on a fair and nondiscriminatory basis. The adoption and use of productivity performance measures will help in achieving this goal.

We encountered a great deal of confusion about NIH's objectives in employing handicapped persons in their mail operation. Although NIH's official policy is one of accommodation, MSB management indicated to us that they are forced to accept all handicapped persons, regardless of their ability to perform the required elements of the job. If, in fact, this is the case, then it is entirely appropriate for NIH to document this policy and to adopt formal written objectives for their handicapped program.

Handling of Conduct and Performance Problems

We believe that if MSB follows our recommendations for providing better employee direction and follows through with concrete efforts to make the sorting function easier to perform productively, the incidence of perceived misconduct and poor performance will decrease. In essence, MSB management must create a "productive environment" as a first step in dealing with conduct and performance problems. Nonetheless, it is likely that MSB will still have to deal with some of these types of problems in the future.

The Office of Personnel Management (published in the Code of Federal Regulations, Title 5) has specific guidelines regarding the handling of both conduct and performance problems. We believe those guidelines to be adequate in handling problems that may arise. The key for MSB is to follow through with the guidelines, to document all actions taken, and to have a concrete method in place for the measurement and evaluation of employee performance. By dealing with these problems in this manner, other "nonproblem" employees will have more motivation and take more pride in performing their jobs productively.

For personnel actions that do arise, MSB will require the complete support of upper-level management at NIH. MSB management has expressed a great degree of frustration to us in dealing with these situations currently. We believe that if appropriate documentation exists, as we have suggested, and NIH upper-level management and associated human resources staff offers the proper guidance and support for MSB actions, MSB can successfully handle conduct and performance problems.

Workload Scheduling and Demand Surge Planning

As with any business that must meet daily production demands placed on it, MSB experiences some heavy demand days and some correspondingly light demand days. We believe MSB management should adhere to the following basic principles in meeting mail pickup and delivery demands:

- Staff the function to handle average demand. Base those staffing levels on accurate productivity and workload measurements taken over time.

- Develop a flexible work force. All employees should be able to perform all functions within the mail operation (sorting, delivery, and metering). Currently, MSB is restricted in that the drivers are classified differently and paid more than the sorting and metering employees. That issue will need to be addressed either by reclassifying all employees or by temporarily transferring those that do driving during some part of the day to the higher paid driver classification. The former is preferable since it offers complete flexibility.

- Adopt a daily planning strategy of having each worker perform multiple tasks. The basic premise should be that all employees should sort in the

early morning, some of those same employees should make the first delivery runs (first-class mail), while the remaining employees continue to sort. When the second deliveries are being made in the afternoon, the remaining employees should begin the metering activity for outgoing mail. The order of priority is sort, deliver, and meter. Those activities should be done in such a way as to get all of today's mail done today, which necessarily means that employees need to perform multiple jobs during the course of the day.

- Use Tuesday and Wednesday to catch up with Monday's (and Saturday's) mail. Not all bulk mail need get delivered the same day early in the week if demand is heavy at that time.

- Use overtime to handle surges in incoming or outgoing mail that are not part of the normal fluctuations experienced at the beginning of each week.

Critical to all of these basic principles is the adoption of workload measurement and productivity measurement schemes. Without those data, management cannot adequately assign the appropriate amounts of manpower to each function within the mail operation.

Risks of Contracting

We do not believe that the contracting of the mail operation poses a high degree of risk to NIH. The key to minimizing that risk is to write a thorough contract statement of work and to have a contingency plan in place in the case of contract nonconformance. The contingency plan could simply be the use of temporary labor. If procedures are well documented (as we have recommended), they can be followed by others should the contractor fail in any way.

APPENDIX A

Customer Survey

We surveyed the mail representatives from each of the institutes, centers, and divisions (ICDs) at the National Institutes of Health (NIH) to assess their satisfaction with current mail service provided, the timeliness of that service, and the needs of the NIH population served. The following pages contain a copy of the survey and cover letter sent to each participant.

LMI LOGISTICS MANAGEMENT INSTITUTE

2000 CORPORATE RIDGE, McLEAN, VIRGINIA 22102-7805 (703) 917-9800

March 17, 1994

Ms. Susan Connors
National Institues of Health
NCI
Building 31, Room 11A34
Bethesda, MD 20892

Dear Ms. Connors:

The Logistics Management Institute is conducting a study for the Division of Support Services (DSS) to improve its mail service operation. As part of the study, Mr. Craig Gavin, Deputy Director DSS, has asked us to interview representative customers from each of the ICDs supported by the mail service operation. His desire is to determine customers' expectations of that service and to obtain customer feedback related to ideas for improving the operation. We understand that you are attending a meeting of all ICD mail managers on March 30, 1994. Accordingly, with Mr. Gavin's consent, we would like to conduct a survey of the attendants to that meeting. In order to minimize the amount of time needed during the meeting, we have developed a questionnaire and enclosed it with this letter. We would greatly appreciate if you would provide us the completed questionnaire at the meeting. Please attempt to answer the questions as you believe would reflect the majority view of the NIH population you represent. If you have any questions, or would like to discuss any aspect of this questionnaire, please contact Don Frank, Sam Mallette, or Ken Goldman at (301) 320-2000. Additionally, we will be available on March 30 to entertain any comments or further discussion about the survey. Thank you for your attention to this matter. Your effort will contribute to improved mail service operations in the future.

Sincerely,

Donald T. Frank

Donald T. Frank

MAIL SERVICE OPERATIONS QUESTIONNAIRE

Name:

Organization:

Building number:

Room number:

1. What date did you receive this questionnaire?

2. What is the date and location of the postmark?

3. What is an acceptable time frame for the Mail Service Branch, upon receipt from the U.S. Postal Service or the interoffice correspondent, to deliver individually addressed, personal mail?

4. What is an acceptable time frame for the Mail Service Branch, upon receipt from the U.S. Postal Service, to deliver mail that is not individually addressed?

5. What frequency of mail delivery and pick-up is sufficient to meet your needs?

Delivery:

U.S. Postal Service mail: 1. Twice daily 2. Once daily 3. Other _____

Interoffice (NIH) mail: 1. Twice daily 2. Once daily 3. Other _____

Pick-up:

U.S. Postal Service mail: 1. Twice daily 2. Once daily 3. Other _____

Interoffice (NIH) mail: 1. Twice daily 2. Once daily 3. Other _____

6. Do you want to receive unsolicited mail sent by external organizations (i.e., junk mail)?

7. We are considering the use of centralized mail delivery points within each of the NIH buildings. Essentially the way it would work is as follows:

   - Each building would contain one or a few "central" clusters of mailboxes. There would be one mailbox for each of the current mail stops in the building.

   - Twice during the day (or more frequently if necessary) one individual from each of the current mail stop areas would pick up the mail for his or her group and drop off any outgoing mail at the cluster area.

   The advantage of this approach is that the Mail Service Branch can devote more effort to sorting the mail and delivering it to your mailbox (as opposed to delivering it to your work area). Consequently they can provide quicker service to you.

   If this approach provided mail delivery and pick-up at least as quickly as the current system, would you accept such an approach (i.e., have someone pick up mail from the central cluster)?

   If so, would you want the centralized cluster location to be on each floor, each wing (if applicable), or would just one location within the building be sufficient?

   If you would not accept this system, why not?

8. What is your current level of satisfaction with mail service support?

   1. Highly satisfied 2. Satisfied 3. Dissatisfied 4. Highly dissatisfied

9. What are the reasons for your current level of satisfaction?

10. Do you use electronic mail? If not, why not?

11. What suggestions do you have that could result in the reduction of paper being sent to you through the mail stream?

12. What improvements would you like to see or what suggestions do you have concerning mail service support in general?

APPENDIX B

Benchmark Data

This appendix provides detailed documentation of a benchmarking study of mail service operations at the National Institutes of Health (NIH) and 10 participating benchmark organizations throughout the Washington, D.C., metropolitan area. To maintain confidentiality of the information provided by the 10 participating benchmark organizations, each is identified by an alphabetic letter and categorized as a university, government agency, or military base in the first two rows of the spreadsheet.

The section labeled "Strategy" identifies various characteristics of each organization's method of processing mail. The row labeled "Mail entry" identifies whether mail is received from the United States Postal Service (USPS) by a central facility that delivers mail to several buildings within an organization or delivered by the USPS to the individual buildings within an organization. The row labeled "Sorting location" identifies whether all sorting takes place at a central facility, an individual building or buildings, or both places. The row labeled "Sorting designator" identifies the basis upon which the mail receives its final sorting. The row labeled "Delivery points" indicates whether mail is delivered to individual mail stops or a central location within buildings. The row labeled "Delivery time" identifies each organization's goal related to the delivery of mail upon receipt from the USPS. In some cases, organizations have established one goal for priority and first-class mail and another goal for all other mail. All other rows in this section are self-explanatory.

The next section, labeled "Size of operation," provides data about the number of customers, buildings, and mail stops for each organization. Customers include faculty, staff, and resident students at universities. Mail stops include only departments at universities.

The section labeled "Annual business volume" identifies the amount of incoming and outgoing mail processed annually and the amount of incoming mail that goes through a first- and second-sorting process.

The section labeled "Resources" identifies the number of full-time equivalent (FTE) employees, the labor cost, and the floor space occupied. FTE employees are categorized on the basis of the number of hours dedicated to processing incoming mail, metering outgoing mail, supervising, miscellaneous activities (including handing of accountable mail), and management or administration. Labor cost includes only the cost of those FTE employees identified in the row labeled "Total (operations) FTEs."

The final section, labeled "Comparisons," provides ratios of cost per piece of mail, average cost per employee, productivity rates, and cost and pieces per customer. In all ratios, "pieces of mail" refers to the daily volume.

Table B-1.
Mail Service Operations Benchmark Analysis

Organization	A	B	C	D	E	
Type organization	University	University	Government	Government	University	Go
Strategy						
Mail entry	Central site	Central site	Central site	Central site	Central site	Ce
Sorting location	Central site, individual building	Central site, individual building	Central site	Central site, individual building	Central site	Cer individ
Sorting designator	Zip code	Zip code	Mail code	Zip code	Box number	Offic
Sorting method	Manual	Manual	Manual	Manual	Manual	M
Delivery points	Mail stop, cluster location	Mail stop, cluster location	Cluster location	Mail stop	Mail stop	M
Type of employees	In-house	In-house	Contract	Contract	In-house	In
Deliveries	1 per day	2 per day	2 per day	6 per day	1 per day	2
Pickups	2 per day	2 per day	2 per day	6 per day	1 per day	2
Delivery time	24 to 48 hours	Same day	24 to 48 hours	4 hours	Same day	24
Size of operation						
Customers	11,100	16,500	9,000	6,500	5,500	2
Buildings	12	86	34	8	75	
Mail stops	165	196	300	320	250	
Customers/mail stops	67	84	30	20	22	
Mail stops/building	14	2	9	40	3	
Annual business volume						
Incoming pieces (000's)	8,000	6,941	4,212	5,529	2,250	
First-sort pieces (000's)	8,000	6,941	4,212	5,529	2,250	
Second-sort pieces (000's)	3,840	6,941	4,212	5,529	0	
Outgoing pieces (000's)	468	3,474	360	363	2,390	
Resources						
First-sort FTEs	7.1	5.5	1.5	2	1	
Second-sort FTEs	2	5.5	2.5	2	0	
Total sort FTEs	9.1	11	4	4	1	
Driver FTEs	0.4	1	2	2.5	1	
Couriers FTEs	1	2.5	—	7	5	

E	F	G	H	I	J	NIH
iversity	Government	Government	Military base	Government	Government	Government
tral site	Central site	Central site	Central site	Central site	Central site	Central site
tral site	Central site, individual building	Individual building	Central site	Central site	Central site, individual building	Central site, individual building
number	Office symbol	Mail stop	Street number	Mail code/room number	Mail code	Building/room number
anual	Manual	Manual	Manual	Manual	Manual	Manual
il stop	Mail stop	Mail stop	Cluster location	Mail stop, cluster location	Mail stop, cluster location	Mail stop
house	In-house	Contract	In-house	In-house	Contract	In-house
er day	2 per day	3 per day	2 per day	2 or 3 per day	3 per day	2 per day
er day	2 per day	4 per day	2 per day	2 or 3 per day	3 per day	2 per day
ne day	24 hours	Same day	Same day	4 hours	4 hours	
,500	20,000	1,700	10,263	14,000	9,429	21,671
75	17	1	99	18	9	68
250	700	50	101	558	320	886
22	29	34	102	25	29	24
3	41	50	1	31	36	13
,250	8,020	598	550	6,500	4,345	9,000
,250	8,020	598	550	6,500	4,345	9,000
0	8,020	—	550	6,500	4,267	7,200
,390	360	254	720	—	1,598	2,250
1	3	0.75	1.5	2.5	14.5	22.5
0	7	—	2	39.5	2.5	16
1	10	0.75	3.5	42	17	38.5
1	3	—	0.5	0.5	2	6
5	7	2.63	—	16	21.3	19.5

Table B-1
Mail Service Operations Benchmark Analysis (continued)

Organization	A	B	C	D	E
Type organization	University	University	Government	Government	University
Resources (Continued)					
Percentage of couriers	8%	15%	0%	41%	56%
Total incoming FTEs	10.5	14.5	6	13.5	7
Total outgoing FTEs	1	2.5	2	2	1
Supervisor FTEs	1	0	2	1	1
Miscellaneous FTEs	—	0	—	0.5	—
Total (operations) FTEs	12.5	17	10	17	9
Management FTEs	1	1	1	2	0
Percentage incoming	84.0%	85.3%	60.0%	79.4%	77.8%
Labor cost (000's)	307	390	450	553	240
Floor space (square feet)	1,428	5,000	1,500	2,304	930
Comparisons					
Sort cost per piece	$0.0280	$0.0364	$0.0427	$0.0235	$0.0119
Delivery cost per piece	$0.0042	$0.0116	$0.0214	$0.0559	$0.0711
Incoming cost per piece	$0.0322	$0.0479	$0.0641	$0.0794	$0.0830
Outgoing cost per piece	$0.1050	$0.0165	$0.5000	$0.3136	$0.0223
Average cost per employee	$24,560	$22,941	$45,000	$32,529	$26,667
First-sort pieces per employee	4,491	5,048	11,232	11,058	9,000
Second-sort pieces per employee	7,680	5,048	6,739	11,058	Not available
Incoming pieces per sorting employee	3,507	2,629	4,212	5,529	9,000
Daily incoming pieces per incoming employee	3,048	1,995	2,808	1,638	1,286
Daily outgoing pieces per outgoing employee	1,872	5,790	720	756	9,560
Annual labor cost per customer	$28	$24	$50	$85	$44
Daily incoming pieces per customer	2.88	1.68	1.87	3.4	1.67
Daily outgoing pieces per customer	0.17	0.84	0.16	0.22	1.74

E	F	G	H	I	J	NIH
University	Government	Government	Military base	Government	Government	Government
56%	30%	53%	0%	25%	38%	25%
7	20	3.38	4	58.5	40.3	64
1	1	0.88	1	3.5	9.7	7
1	2	0.75	1	3	6	5
—	—	—	3	—	—	0.5
9	23	5	9	65	56	76.5
0	1	1	1	1	2	5
77.8%	87.0%	67.5%	44.4%	90.0%	72.0%	83.7%
240	989	125	226	1,333	1,241	1,920
930	6,000	600	800	5,800	2,700	10,676
$0.0119	$0.0536	$0.0314	$0.1598	$0.1325	$0.0867	$0.1074
$0.0711	$0.0536	$0.1098	$0.0228	$0.0521	$0.1188	$0.0711
$0.0830	$0.1072	$0.1412	$0.1826	$0.1846	$0.2055	$0.1785
$0.0223	$0.3583	$0.1598	$0.1744	Not available	$0.2177	$0.1394
$26,667	$43,000	$25,000	$25,111	$20,508	$22,161	$25,098
9,000	10,693	3,189	1,467	10,400	1,199	1,600
lot available	4,583	Not available	1,100	658	6,827	1,800
9,000	3,208	3,187	629	619	1,022	935
1,286	1,604	708	550	444	431	563
9,560	1,440	1,162	2,880	0	659	1,286
$44	$49	$74	$22	$95	$132	$89
1.67	1.6	1.41	0.21	1.86	1.84	1.66
1.74	0.07	0.6	0.28	Not available	0.68	0.42

APPENDIX C

A Methodology for Specifying the Operational Characteristics of the NIH Mail Operation

In this appendix, we present a systematic methodology for the Mail Services Branch (MSB) to follow in defining the way in which it will process the mail at the National Institutes of Health (NIH). That methodology includes the following steps:

1. Decide what service to provide
2. Determine how to provide that service
3. Establish functional productivity targets
4. Determine delivery routes
5. Determine sorting configuration
6. Calculate resource requirements
7. Design a central facility layout.

Each step builds upon the previous one to define more of the operation. If MSB changes the solution to a particular step in the process, it must readdress all succeeding steps.

The intention of this appendix is to provide a framework, or way of thinking, about the operational issues associated with managing the mail service operation, not to recommend the actual operational details. Nonetheless, in each step of our methodology, we either recommend or suggest a solution. The recommendations, generally more strategic in nature, are consistent with those in Chapter 5 of our report, and the suggestions are simply ideas that we believe are feasible ones.

The methodology we use makes some basic assumptions. It rules out the possibility of using the United States Postal Service (USPS) to deliver mail directly to buildings or individuals at NIH although we believe that in the long term, USPS may do just that. Our methodology is based on the assumption that NIH will follow the strategies we have outlined in Chapter 5 of our report, namely that NIH will adopt a centralized operation providing cluster delivery

service. If that assumption changes, some of the steps in the methodology may also change.

STEP 1: DECIDE WHAT SERVICE TO PROVIDE

In this step, MSB must decide and document four issues: the type of service to provide, the number and location of mail stops, the target cycle time for processing incoming and outgoing mail, and the number of daily pickups and deliveries to provide.

In our report, we recommend that MSB use cluster deliveries as the type of service it provides. That recommendation was based on the general acceptability of cluster service by the NIH population and the dramatic impact it would have on labor required to perform the mail distribution function. We suggest that NIH provide one cluster location in each building with the exceptions of Buildings 10 and 31 on campus, where the largest population of customers are located. In those buildings, we suggest using several clusters. The best way to service Building 31 with cluster deliveries is probably by wing, and the best way to service Building 10 is probably by floor. This strategy would create a total of 77 cluster locations with between 1 and 122 mailboxes per cluster. We discuss these calculations further in Step 4.

We suggest that MSB start by using the current set of 886 mail stops and that it establish new mail stops under some criteria that incorporates at least 20 persons per new mail stop. A mail stop supporting 4 people provides a nearly individualized level of service; whereas, a mail stop supporting 24.5 employees provides the current NIH average level of service.[1] Organizational structure and geography have, in the past, had more influence on the number of mail stops than cost or processing capacity considerations. We believe that the impacts on cost and capacity need to be considered in a systematic way when defining specific mail stops and service in general. By establishing specific criteria for adding mail stops, MSB can begin to control its costs and plan its required processing capacity. We suggest a preliminary target of at least 20 persons per mail stop because that approximates the current situation.

We recommend that MSB continue with twice daily pickups and deliveries of mail. In our customer survey, we found that nearly all those surveyed wanted twice daily service. Many other organizations provide this type of service. Some that we talked with try to deliver all first-class mail on the first delivery and then handle other types of mail subsequent to that. We recommend this approach for MSB.

We recommend that MSB target mail to be delivered within 24 hours of receipt from USPS. Many of our customer survey respondents want and even expect this type of service. Other organizations are able to provide it for the most part. We would expect that not all bulk mail will be delivered within 24 hours on heavy

[1] 21,671 employees divided by 886 mail stops yields 24.5 employees per mail stop.

days, especially at the beginning of the week, but we believe that NIH can meet this goal for all first-class mail and for a large percentage of the remaining mail.

We suggest that MSB make the first pickup and delivery between 9:30 a.m. and 12:00 noon and the second pickup and delivery between 1:30 p.m. and 4:00 p.m. This provides for 2 hours of delivery time and a half hour transport time for each of the two pickups and deliveries. Those times will give MSB a chance to sort all first-class mail before the first delivery and will allow outgoing mail to be processed the same day (some shift staggering may be necessary). MSB must publish scheduled pickup and delivery times at each cluster location. It must also target time windows during the day for performing the first-sorting, second-sorting, and metering functions so that it can meet the delivery schedule and meet the service goals discussed above. *We suggest performing the first sorting over a 5-hour time period from 7:00 a.m. to 12:00 noon, the second sorting over a 5-hour period from 8:00 a.m. to 1:30 p.m. (with a half hour off for lunch), and the metering over a 5-hour period from 1:00 p.m. to 6:00 p.m.*

STEP 2: DETERMINE HOW TO PROVIDE THAT SERVICE

In our report, we recommend that NIH centralize all sorting operations in the Stonestreet facility (Rockville, Md.) and that it not pursue the use of complex automation. Essentially, the method is to receive all USPS and interoffice mail centrally, sorting it first by route and then by mail stop, and delivering it to the clusters defined in Step 1. Likewise, outgoing mail should be picked up and brought back to the central facility for metering. We believe that the outgoing mailboxes in the clusters can be set up by route so that each person mailing letters can put them in the appropriate route boxes, although that is not essential.

We also recommend that MSB continue its pursuit of zip+4 coding on all mail and that it organize its sorting strategy around those codes. The proper use of mail stop coding is essential to improving the productivity of the mail-sorting function. Ideally, the first one or two digits should specify a route number or a portion of a route or even a cluster; and the last two digits, the individual mail stop. We discuss this suggestion further in Step 5.

STEP 3: ESTABLISH FUNCTIONAL PRODUCTIVITY TARGETS

In order to plan routing, scheduling, and resource requirements, it is necessary to define the mail sorting, delivering, and metering productivity levels expected of employees performing those functions. Current productivity levels are 193 pieces per hour for sorting, 165 pieces per hour for metering, and 13 stops per hour for delivering (see Chapter 2).

We suggest that MSB plan a level of 500 pieces per hour for sorting, 165 pieces per hour for metering, and 8 to 10 cluster stops per hour for delivery. The increased sorting productivity represents the midpoint between MSB's current sorting

productivity and that of the most efficient organizations we visited in the benchmarking study described in Chapter 3. We do not suggest planning any large increases in metering productivity at this time. The cluster delivery productivity we suggest is lower than the current delivery productivity of 13 stops per hour, because each cluster delivery services an average of 10 mailboxes. Some adjustment to that productivity may be necessary. We suggest MSB use a planning figure of 7 productive hours per day per employee and an absentee rate of approximately 10 to 15 percent on any given day for planning purposes. It will also be necessary to plan transit times for those employees involved in delivering to the various cluster locations.

STEP 4: DETERMINE DELIVERY ROUTES

Step 4 involves using the delivery windows defined in Step 1 and the productivity levels defined in Step 3 to calculate the number of routes required and then balancing the workload across those routes as evenly as possible. If drivers spend approximately a half hour in the morning and again in the afternoon to travel between the central facility and the campus or designated area of their pick-ups and deliveries, they have about four hours to make 154 cluster deliveries (77 clusters serviced twice a day). At a rate of 8 per hour, each route can service about 32 clusters, and NIH needs at least five routes. Because of the inability to completely balance the workload across routes, more routes may be needed.

We suggest that MSB designate four primary routes on campus and two off campus. The first five columns of Table C-1 illustrate the buildings covered, number of mail stops, number of clusters, and population serviced for each proposed route. The "Campus #1" route should be devoted solely to Building 10. The remaining on-campus routes should be split evenly according to mail stop, cluster, and employee population distribution.[2] We suggest using the "Campus #2" route to service Buildings 31, 36, 37, and 49; the "Campus #3" route to service Buildings 1, 3 through 9, 12, and 13; and the "Campus #4" route to service the smaller, remaining buildings on campus. The off-campus "Central" route should include all buildings on Executive Boulevard, the Parklawn, Twinbrook, Park, Solar buildings, and the Danac warehouse. The off-campus "South" route should include the Westwood building, the Federal building, and other off-campus locations near or south of the campus, including those sites on Old Georgetown Road. We also suggest that MSB operate a smaller "North" route to service the two buildings north of the Stonestreet facility (9610 Medical Center Drive and 5 Research Court). Based on our calculations, we believe our suggested routings will provide the required service in the approximate 2-hour time frames suggested in Step 1. MSB should revise this suggestion, as it feels necessary, in order to reflect information not available to us at the time of this report.

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[2] We found that the percent of employee population served is closely correlated to the percent of mail delivered (by building). The annual NIH Census report contains employee population data and is available from the Space Acquisition Branch of the Division of Space and Facility Management.

Table C-1.
A Possible Routing and Sorting Scheme

Route	Buildings covered	Mail stops	Clusters	Population served	Primary sort	Primary sort categories
Campus #1	Building 10	222	10	6,514	By cluster within the building	10
Campus #2	Building 31 Building 36 Building 37 Building 49	197	6	4,397	By cluster — 3 clusters in Building 31, 1 in each of the other buildings	6
Campus #3	Building 1 Buildings 3 through 9 Building 12 Building 13	148	10	2,371	by cluster — 1 in each building	10
Campus #4	Small campus buildings	50	34	3,088	One primary sort category for entire route	1
Central	Executive Plaza Executive Blvd. buildings Parklawn Park Solar Twinbrook II Danac warehouse	104	8	3,211	By cluster — 1 in each building plus some extra ones at Parklawn	8
South	Westwood Federal Old G'town Rd. building Boy Scouts Jones Bridge Rd.	157	6	2,090	by cluster — 1 in each building	6
North	9610 Medical Center Dr. 5 Research Court	2	2	0	by cluster — 1 in each building	2
Stonestreet	Miscellaneous mailstops	6	1	0	Separate category for misdirected mail. All others combined.	2
Total	—	886	77	21,671	—	45

STEP 5: DETERMINE THE SORTING CONFIGURATION

Once MSB establishes the mail stops, cluster locations, and routes, it can determine the sorting configuration. Because of the 886 mail stops, we believe that a two-level sorting is necessary. The first level should break down the mail to at least the route level and probably to some level within each route, either clusters or groups of clusters. The last two columns of Table C-1 show our scheme for the first sorting operation and the resulting number of first sorting categories for each route. Note that the number of mail stops is the number of second sort

categories for each route. *We suggest that the first-level sorting break down to the cluster level for all except the route we have called "Campus #4"; – that route should have only one presorting category. We also suggest that the first two digits of the 4-digit mail code (zip+4 program) designate this sorting level. Finally, we suggest that the last two digits of the mail code signify the mail stop within a particular cluster.* This approach yields 45 presorting categories and 886 final sorting categories for the NIH mail.

STEP 6: CALCULATE RESOURCE REQUIREMENTS

The next step in the operational planning process is to calculate the labor and equipment resources needed to do the job. Table C-2 is an example of how resources might be allocated given the productivity rates and time windows described above. Essentially, the direct functions to be performed are first sorting, second sorting, delivery, and metering. Based on daily volumes and productivity rates, we can calculate the number of daily hours needed to perform each direct function. We then factor in a desired number of hours during the day for each function to be completed (time window), and we can calculate the number of persons or stations needed at any one time during the time window for that function. Those calculations should allow for some nonproductive time (we use 13.5 percent). Gross full-time equivalent (FTE) employees can be calculated under the assumption of 8-hour shifts. The net number of FTE employees allows for 15 percent absenteeism and therefore reflects the total amount of staffing that needs to be assigned. We assume that 2.5 and 1.0 gross FTE employees are required for reading and supervising respectively. The result of these calculations using our suggested productivity rates and time windows is a need for about 34 FTE employees.

The equipment requirements should also be calculated at this step of the process. We can use the column labeled "Number of Stations" in Table C-2 to assist in that determination. Theoretically, the number of stations is the number of pieces of equipment needed in each function under the assumption that the people working that function use their own unique piece of equipment (i.e., do not share). In the case of the first-sorting operation, that assumption probably makes sense and means that nine separate first-sorting stations are needed.[3]

The second sorting requires 14 stations, but Step 5 shows only 6 primary routes. MSB has the option of using one sorting station for each route and then putting more then one sorter at some of the stations or it can set up duplicate sorting stations for some of the second sortings. Also, it can expand the window of sorting time but that action would delay mail delivery. We suggest starting with one station for each of the primary routes and then doubling or tripling employees where necessary. Since most of the routes will already be sorted by

[3] Current plans for the sortation conveyor call for six stations. Our analysis shows that nine are needed. The other three can be provided by adding stations to the sortation conveyor, by adding manual sort stations, or by using two employees at three of the stations.

cluster at this stage of the sorting process, employees at stations with two and three employees should be able to work separate sections within their assigned areas.

Table C-2.
Resource Requirements

Function	Daily volume	Productiv-ity	Daily hours required	Time window	Number stations	Gross FTE	Net FTE
First sort	30,000	750	40	5	9.1	5.7	6.7
Second sort	30,000	500	60	5	13.7	8.6	10.1
Delivery	154	7	22	4	6.3	3.1	3.7
Metering	9,000	165	54.5	5	12.5	7.8	9.2
Reading	56					2.5	2.9
Supervising						1	1.2
Total						28.7	33.8

Column calculations:

(2) Daily Volume = average daily volume in pieces for sorting and metering and number of cluster stops for delivery.

(3) Productivity = required volume that must be processed per hour.

(4) Daily Hours Required = labor hours needed at stated productivity rates.

(5) Time Window = amount of time during the day in which the function must be completed.

(6) Number Stations = number of people working at one time. It assumes productive time is 87.5 percent of total time worked.

(7) Gross FTE = number of FTE needed per day to staff the function.

(8) Net FTE = number of FTE management needs to allocate to the operation. It assumes 15 percent absenteeism.

Notes concerning number of stations:

(1) The number of stations for the first sort function represents the number of Novak sorter stations required. Plans call for only 6 Novak sorter stations. Under this scheme, either those plans must be modified to include 9 stations or 3 manual primary sort stations must be added in (at a productivity rate of 500 pieces per hour).

(2) The number of stations for the second sort function really indicates the number of employees needed to staff this function in the allotted time window. Those employees can either double up on the second sorting for some routes, or there can be duplicate sort stations setup for some of the routes.

(3) The number of stations for the delivery function theoretically represents the number of employees needed to staff this function during the allotted time window. That number must correspond to the number of routes and the number of delivery vehicles.

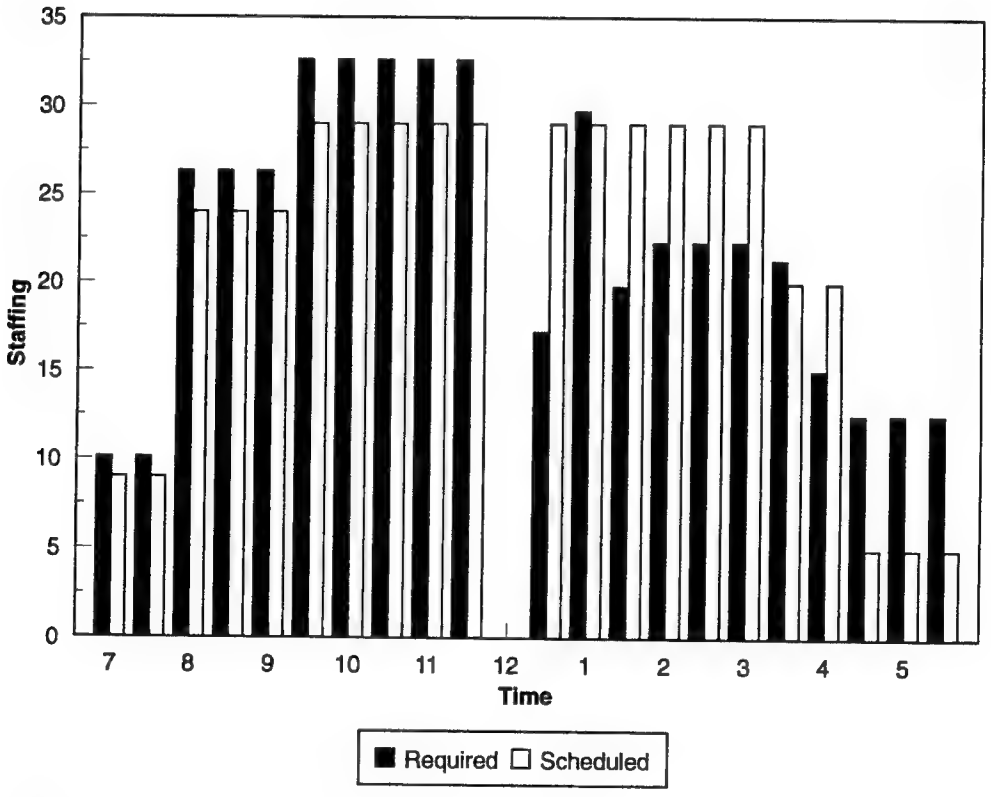
(4) The number of stations for the metering function theoretically represents the number of postage meters required during the allotted time window assuming they are each staffed by one individual. It is likely that metering productivity will be considerably higher and fewer employees and machines will be necessary.

The delivery function requires six stations, which corresponds to the six primary routes. A seventh smaller, less time-consuming route will need to run to the buildings north of the Stonestreet facility. Practically speaking then, MSB

will need seven delivery vehicles and some arrangements for replacements should one of those vehicles need servicing.

The metering function appears to require 12 to 13 stations. We know that MSB currently uses about half that number so it is reasonable to assume that we can put more than one employee on a station. We suggest starting with two employees per metering station. In the long run, it may be possible to obtain higher metering productivity simply by using only one person per station for metering activity.

Once the desired staffing levels have been calculated for each function, MSB must determine a work schedule. Almost 29 gross FTE employees are required per day. Figure C-1 shows the total staffing needed during the course of the day to meet the required time windows for each function. It also shows a suggested work schedule that will meet those requirements. *Our suggested schedule utilizes 9 employees on a first shift from 7:00 a.m. to 3:30 p.m.; 15 employees on a second shift from 8:00 a.m. to 4:30 p.m.; and 5 employees on a third shift from 9:30 a.m. to 6:00 p.m. It assumes a half hour lunch period from 12 noon to 12:30 p.m.*



Note: Schedule assumes 9 employees from 7:00 a.m. to 3:30 p.m., 15 employees from 8:00 a.m. to 4:30 p.m., and 5 employees from 9:30 a.m. to 6:00 p.m. Lunch is scheduled from 12:00 noon to 12:30 p.m.

Figure C-1.
Required Hours Versus Scheduled Hours

STEP 7: DESIGN A CENTRAL FACILITY LAYOUT

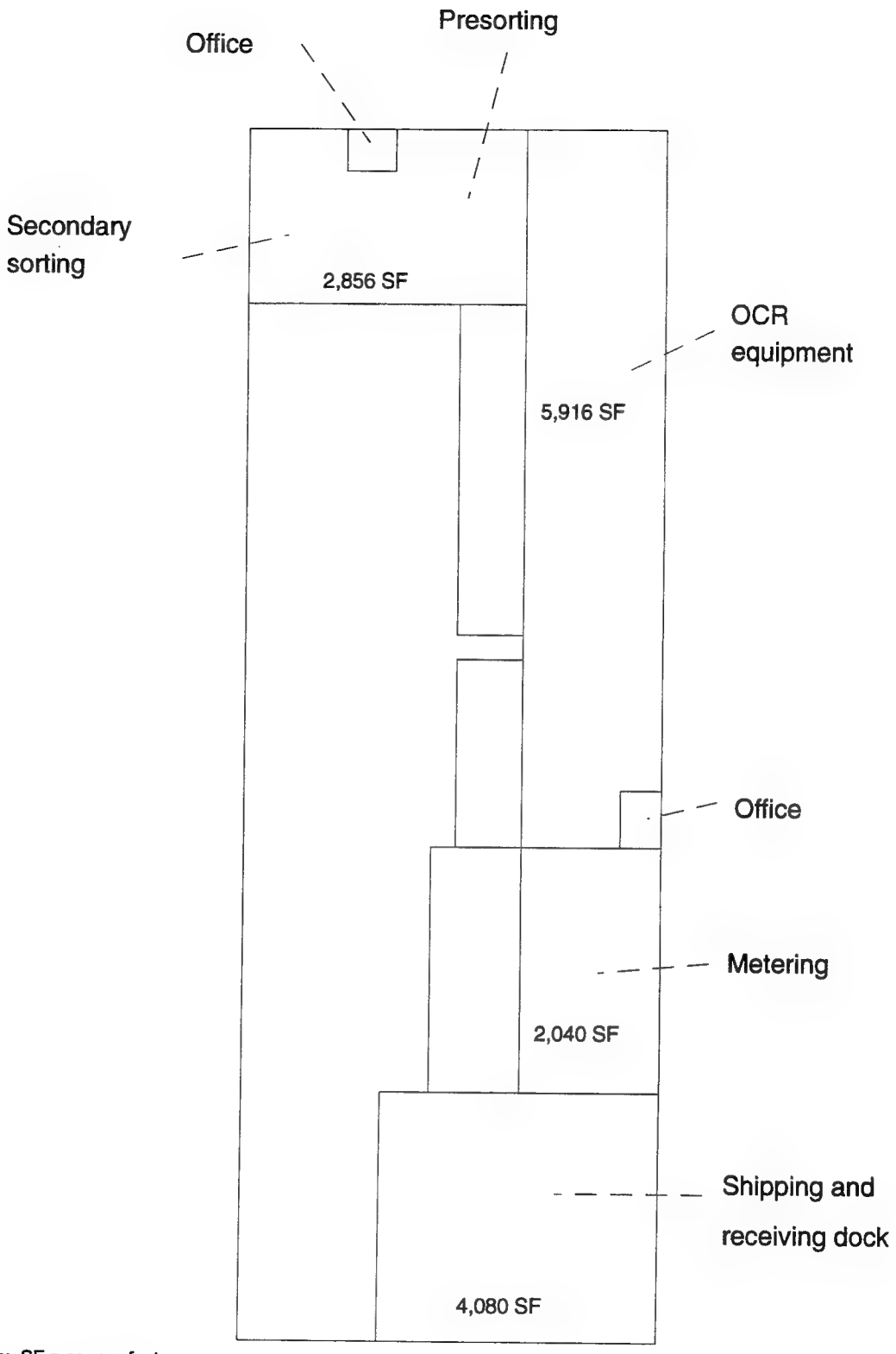
The existing floor plan of the new mail center located on Stonestreet Avenue in Rockville, Md., is shown in Figure C-2. It occupies over 10,000 square feet of floor space not including the shipping and receiving docks, which are shared with the reproduction service at NIH. The major functional components of the layout include

- a space of 2,856 square feet, including an enclosed private office, originally intended to house manual operations for both presorting and final sorting;
- a space of 5,916 square feet that currently houses sorting operations, including an office; the space was originally intended to accommodate a large piece of automated optical character recognition (OCR) sorting and bar coding equipment;
- a postage metering room occupying 2,040 square feet;
- a protected receiving and shipping area of 4,080 square feet that provides for the loading or unloading of four trucks or vans simultaneously; and
- a small amount of square footage for administrative offices (not shown in Figure C-2).

The Stonestreet floor plan was designed to accommodate a high degree of automation using OCR equipment. However, because of concerns about the appropriateness (arising from its high costs) and reliability of the equipment, MSB decided against acquiring the equipment at this time. We believe that more than adequate space is available for the performance of mail processing functions. In our benchmarking study, all of the organizations we found utilize considerably less than 10,000 square feet (the highest was about 6,000 square feet). The available space, being relatively open and unobstructed, provides a good deal of layout flexibility. Metering and sorting workstation configurations can be adjusted readily.

We observed manual mail processing operations in these spaces and believe that several simple layout adjustments will improve the flow and processing of mail. Figure C-3 contains one proposal for modifying the current layout. That suggested layout incorporates the following improvements:

- It utilizes a smaller more open, easily supervised area. Our suggested layout utilizes the "elongated" areas originally designated for OCR equipment and metering activity. This reduces floor space to less than 8,000 square feet, which should still provide ample room for the operation. Our suggested layout places all functions, including the reading of misdirected mail in this reduced, open area.
- It allows MSB to continue to treat incoming and outgoing mail separately, but incorporates flow lines for each. Such flow lines avoid the necessity of



Note: SF = square feet.

Figure C-2
The NIH Existing Mail Service Layout

moving newly received mail that requires sorting through the metering area. It also moves material in straight lines that conform to technological processing requirements. It avoids backhauling and promotes standardization of material movement routes.

- It places a foreman's office in the middle of the entire operation. That office is strategically located in that it is next to the main pedestrian entry for the operation. The central location affords the foreman better direction of the entire operation because he or she can see most everything that is going on. The location next to the pedestrian entry allows better control of unauthorized persons and affords the supervisors better knowledge as to the whereabouts of any employee at a particular point in time.

- It moves the mail the furthest when it is unprocessed because it is in the largest and most easily movable containers. The idea is that when sorting or metering is complete, the mail is essentially located at or near the shipping dock.

- It sets up a material-handling aisle for all unprocessed mail (down the middle of the area). No aisle is needed for the flow of work in process because it flows within the processing lines.

- It makes all operations accessible from the material handling aisle by placing each one adjacent to the aisle.

We believe that these changes will create a more efficient, smoother material flow and will improve the ability of the supervisory staff to provide employee direction when it is needed.

The numbers in Figure C-3 designate the flow of material. The incoming mail is processed as follows:

- Unprocessed incoming mail arrives at the shipping dock.

- Unprocessed incoming mail is wheeled to Area (1) as shown in Figure C-3.

- The first sorting of incoming mail is performed in Area (2).

- The second sorting is performed in Area (3). Any misdirected mail is transferred across the aisle to Area (5). When a correct address is found for that mail, it is returned to Area (2) for further sorting.

- When secondary sortings are complete, the mail is sorted by mail stop (and route). Mail for each building on each route is then staged in Area (4), perhaps using a separate mail bag for each cluster or building.

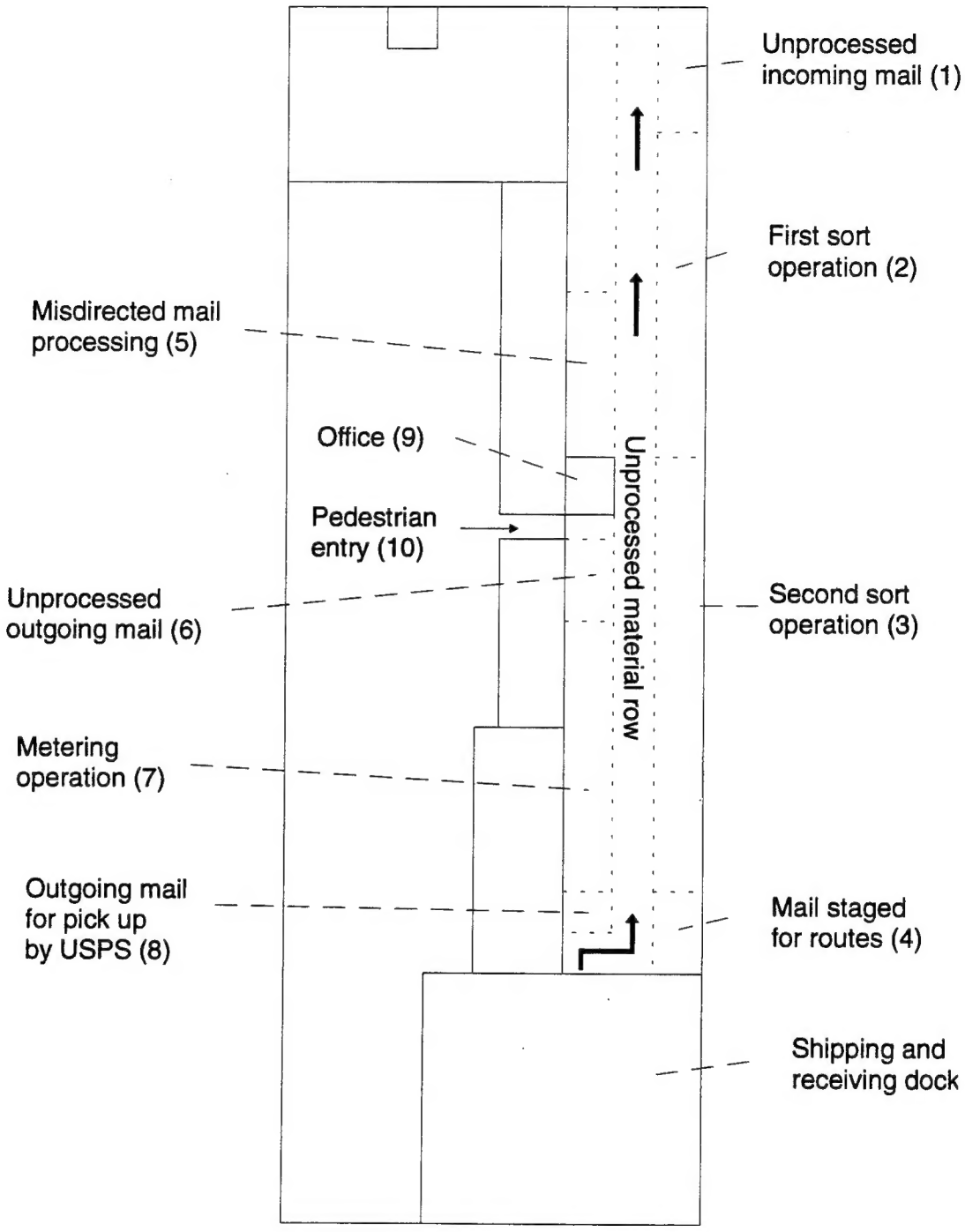


Figure C-3
The NIH Mail Service Proposed Layout

Essentially, incoming mail flows up the central incoming aisle and flows back down the right side of Figure C-3.

Outgoing mail is processed as follows:

- Unprocessed outgoing mail arrives at the shipping dock.
- Unprocessed incoming mail is transported to Area (6) in Figure C-3.
- Metering is performed in Area (7).
- Processed outgoing mail awaiting USPS pickup is staged in Area (8).

Essentially, outgoing mail flows up the central aisle and back down the left side of the elongated area in Figure C-3.

The suggested layout incorporates the following minor structural changes in the Stonestreet facility:

- The office in the elongated area is relocated from its current position to a new position adjacent to the pedestrian entry door [Area (10) in Figure C-3].
- The walls separating the current metering room and OCR equipment room are removed.
- A wall is built between the elongated area (current OCR equipment area) and the original sorting area. Essentially, the original sorting area should be closed off and used for other purposes.
- Carpeting is removed from the center unprocessed material flow aisle for easier material movement.

SUMMARY

The net result of following our proposed operational planning methodology will be a documented, better managed, and ultimately more productive operation in terms of labor resources needed and services provided. The specific output of this process should be a routing and sorting scheme similar to that shown in Table C-1, a set of resource assignments similar to that shown in the columns labeled "Gross FTE" and "Net FTE" in Table C-2, a work schedule similar to that described in Figure C-1, and a layout similar to that shown in Figure C-3. The MSB staff may require some operations management training to undertake this kind of analysis but will ultimately benefit from having done so.

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13. ABSTRACT *(Maximum 200 words)*

The National Institutes of Health (NIH) operates a mail service for its 21,000 employees located on and nearby its campus in Bethesda, Md. That service uses 54.5 in-house full-time equivalent (FTE) employees to deliver 30,000 pieces of mail to 800 mail stops and post 9,000 pieces of outgoing mail daily. NIH wants to know the most cost-effective way to meet the mail service needs of the NIH community in terms of services provided, mix of in-house and contract operations, number of employees, degree of centralization of services, and amount of automation.

We studied the NIH mail operation in detail and compared it to mail operations at 10 other organizations. Based on our findings, we recommend that in the short term, NIH utilize a centralized operation without extensive automation and run that operation primarily with in-house employees. We also recommend that NIH provide cluster delivery service. In the intermediate term, we recommend that NIH stress the evolution to a more efficient operation, and in the long term, we recommend that NIH use a centralized operation staffed by contract employees.

Adopting our recommended actions and strategies will result in total, quantifiable, short-term labor savings to NIH of approximately $500,000 annually, intermediate-term savings of approximately $1 million annually, and long-term savings of $1.2 million annually. In addition, the number of in-house FTE employees will be reduced by 18.5 in the intermediate term and 54.5 in the long term. Most important, however, service will be timely and the NIH population will be likely to use the mail service rather than other, more costly forms of communication.

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